

REMARKS

Claims 41-69 are pending.

Claims 41-69 are rejected.

Claims 47 is amended.

Applicants request reconsideration of claims 41-69.

I. Finality of Office Action

The Examiner made the Office Action dated 9/12/03 a final Office Action because of the information disclosure statement (IDS) submitted with the previous response. As authority, the Examiner cited MPEP §609(B)(2)(i). However, Applicants cannot find an MPEP provision reflecting that precise citation. The citation most similar in form seems to be MPEP §609(III)(B)(2)(a)(i), but that actually addresses when final rejection is *not* appropriate. The next provision, MPEP §609(III)(B)(2)(a)(ii), indicates that, when an IDS is submitted within the relevant time and with the 37 C.F.R. §1.17(p) fee, the Examiner “may” make the next Office Action final. That section appears to be more relevant to the facts of the current prosecution and indicates that the finality of the Office Action is at the Examiner’s discretion. (A copy of MPEP §609(III)(B)(2)(a)(i)&(ii) is included in an appendix to this Amendment and Response.)

In analyzing the Examiner’s exercise of discretion, it should be noted that Applicants’ IDS merely cites the parent of a patent cited in rejections of the previous Office Action (dated 6/6/03). Further, all of the rejections of that previous Office Action relied upon matters that could not be considered prior art. Given the relationship between the one patent in Applicants’ IDS and the patent previously cited by the Examiner, combined with the lack of any substantive rejection in the Office Action dated 6/6/03, Applicants contend that the finality of the latest Office Action dated 9/12/03 represents an abuse of discretion. Accordingly, Applicants request that the Examiner withdraw the finality of the Office Action dated 9/12/03.

II. Rejection of claims under §103

The Examiner rejected all of claims 41-69 as being obvious, articulating different reference combinations for different groups of claims. However, all of the rejections require at

least some combination of the teachings in Redeker (U.S.Pat. No. 6,170,428) and Ameen (U.S.Pat. No. 5,834,371). Applicants contend that any such combination is untenable; adding teachings from another patent (U.S.Pat. No. 5,916,455 by Kumagai) merely exacerbates the problems with combination; and the Examiner's reasoning is flawed. Applicants submit that any one or combination of these reasons demonstrates that the *prima facie* burden for the obviousness rejections has not and cannot be met.

A. Conflicts between Redeker and Ameen discourage combination

Every obviousness rejection requires that the multiple prior art references suggest to one of ordinary skill in the art to combine the references. (*See United States Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1564, 41 U.S.P.Q.2d 1225, 1233 (Fed. Cir. 1997), *cert. denied*, 522 U.S. 950 (1997).) Further, in reviewing the references, the Examiner must consider the references *as a whole*. (*In re McLaughlin*, 443 F.2d 1392, 170 U.S.P.Q. 209, 212 (C.C.P.A. 1971) (emphasis added).) Moreover, when the prior art contains conflicting references, the inability of each reference to suggest solutions to one of ordinary skill in the art must be considered. (*See In re Young*, 927 F.2d 588, 18 U.S.P.Q.2d 1089, 1091 (Fed. Cir. 1991). A copy of *Ethicon* has been provided previously during prosecution. Copies of *McLaughlin* and *Young* are included in appendices to this Response.) Applicants contend that, when viewed as a whole, Redeker and Ameen conflict to such an extent – in terms of both their general matters as well as the specific teachings relied upon by the Examiner – that one of ordinary skill in the art would be discouraged from combining their teachings.

First, Applicants note that Redeker and Ameen are directed to different issues. Redeker's teachings are concerned with apparatus components such as (1) a plasma source including a gas distribution system; (2) a chamber including a chuck and pumping system; and (3) a remote microwave plasma system for *cleaning the chamber*. (Redeker at col. 4, ln. 3-11.) Redeker touts such components for the purpose of depositing doped and undoped silicon dioxide. (*Id.* at Abstract; col. 1, ln. 37-39 (Background); col. 2, ln. 60-61 (Summary).) Ameen, on the other hand, focuses on depositing metal and, more specifically, *cleaning a contact site* on a wafer before depositing metal therein. (Ameen at col. 1, ln. 45-60; col. 3, ln. 13-19, 22-25; col. 8, ln. 42-46; col. 9, ln. 22-25.) Applicants contend that an ordinary artisan concerned with a chamber

for depositing doped or undoped silicon dioxide would not be motivated to combine such teachings with those from a reference for contact cleaning and metalization. Conversely, an ordinary artisan concerned with cleaning and metalizing a wafer's contact would not be motivated to combine such teachings with those from a reference for a chamber and method for silicon dioxide deposition.

Further, once the specifics of each reference are considered, it is revealed that they teach away from each other, thereby actively discouraging one of ordinary skill in the art from attempting to combine their teachings. As mentioned above, Redeker teaches a system that generates a cleaning plasma in a location remote with respect to its main chamber. (Redeker at Abstract (last phrase); col. 2, ln. 54-56; col. 7, ln. 29-col. 8, ln. 6; FIG. 9.) Significantly, Redeker expressly touts a microwave-based remote plasma cleaning system. (*Id.* at col. 7, ln. 35, 38, 67.) Redeker explains that locally generated cleaning plasmas will either take too long or require high temperatures and pressures that result in "over cleaning." (*Id.* at col. 2, ln. 30-45.) In direct contradiction to such teachings, Ameen discourages remote plasma generators in general and microwave-based remote plasma generators in particular, warning that such devices are complex, expensive, and occupy substantial space. (Ameen at col. 2, ln. 54-62; col. 3, ln. 49-52.) Ameen encourages a locally generated plasma instead. (*Id.* at Abstract; col. 3, ln. 13-19; col. 9, ln. 1-21.) As a result, one of ordinary skill in the art keeping Redeker in mind would view Ameen as undesirably allowing (1) decreased throughput due to the time required for Ameen's local plasma; or (2) increased cost in consumables due to "over cleaning" involved with Ameen's local plasma. (See Redeker at col. 2, ln. 30-45.) Conversely, such an artisan keeping Ameen in mind would view Redeker as requiring an undesirable amount of device complexity, cost, and space due to Redeker's remote plasma system.

Accordingly, the Redeker/Ameen conflicts – which range from their general purposes to their specific teachings and include points specifically relied upon by the Examiner – actively discourage one of ordinary skill in the art from *any* combination of their teachings. Such discouragement applies to the two Redeker/Ameen combinations the Examiner attempted to articulate. (See Office Action dated 9/12/03 at p. 3 (attempting to describe modifying Redeker according to Ameen) and p. 7 (attempting to describe modifying Ameen according to Redeker).) Because all of the current rejections are based on some Redeker/Ameen combination, the *prima facie* burden for these obviousness rejections has not and cannot be met.

The obviousness rejections against claims 55 and 56 attempt to add the teachings from Kumagai. However, a careful review of Kumagai as a whole illustrates that its teachings conflict with those of both Redeker and Ameen, thereby further emphasizing that the *prima facie* burden for rejection has not and cannot be met relying on these references. For instance, Kumagai actively refrains from initiating a plasma in its main chamber. (Kumagai at Abstract; col. 2, ln. 5-8; col. 4, ln. 52-col. 5, ln. 7.) In doing so, it actively conflicts with Ameen. (Ameen at Abstract; col. 3, ln. 13-19; col. 9, ln. 1-21 (all encouraging a locally generated plasma).) The reason Kumagai actively refrains from initiating a plasma in its main chamber is to avoid etching the sidewall of its main chamber. (Kumagai at col. 1, ln. 42-52.) Such reasoning, however, is in direct conflict with the teachings of Redeker, which emphasize the importance of etching at the chamber walls in order to remove undesirable deposits. (Redeker at col. 2, ln. 21-45.) In order to avoid etching the sidewall of its main chamber, Kumagai emphasizes systems for remote plasma generation. (Kumagai at col. 2, ln. 9-13; col. 3, ln. 50-col. 4, ln. 14; col. 4, ln. 52-65; FIGS. 1&2 (illustrating plasma ignition device 30).) Such emphasis once again conflicts with Ameen, which, as mentioned above, discourages remote plasma generators, warning that such devices are complex, expensive, and occupy substantial space. (Ameen at col. 2, ln. 54-62; col. 3, ln. 49-52.)

Thus, one of ordinary skill in the art keeping Kumagai in mind would view Ameen as encouraging a choice between two undesirable alternatives – either allowing a locally generated plasma to damage the chamber sidewalls or risking extinguishing the plasma. (See Kumagai at col. 1, ln. 42-52.) Such an artisan continuing to keep Kumagai in mind would view Redeker's sidewall etching as risking damage to the chamber. Conversely, the ordinary artisan keeping Redeker in mind would view Kumagai's avoidance of sidewall etching as undesirably allowing a buildup of deposition materials on the chamber walls which, in turn, would flake off and contaminate a workpiece. (See Redeker at col. 2, ln. 21-45.) Moreover, the artisan keeping Ameen in mind would view Kumagai's remote plasma generator as requiring an undesirable amount of device complexity, cost, and space.

Accordingly, the Redeker/Ameen/Kumagai conflicts further actively discourage one of ordinary skill in the art from *any* combination of their teachings. Such discouragement applies to the Kumagai modification of the Examiner's two Redeker/Ameen combinations addressed

above. As a result, the *prima facie* burden for rejecting claims 55 and 56 as being obviousness has not and cannot be met to an even greater degree than the other claims.

B. Flaws in the Examiner's reasoning further highlight the failure to meet the *prima facie* burden for rejection

As an addition or alternative to the reasons presented above for withdrawing the rejections, Applicants contend that flaws in the Examiner's reasoning also demonstrate a failure to meet the *prima facie* burden for rejection.

1. The Examiner's mischaracterization of the references' teachings

For example, the Examiner's reasoning contains several instances of mischaracterizations of the references. Specifically, on page 3 of the Office Action dated 9/12/03, the Examiner interprets Redeker as failing to teach depositing an electrically conductive material that would inherently prevent inductive coupling. Applicants contend a more accurate interpretation of Redeker is that it actively teaches the exact opposite -- depositing doped and undoped silicon dioxide. (Redeker at Abstract; col. 1, ln. 37-39 (Background); col. 2, ln. 60-61 (Summary).) Given such deposition, undesired prevention of inductive coupling is not an issue. Hence, as described above in part A, one of ordinary skill in the art would lack a motive to seek solutions in Ameen. Applicants contend that the Examiner's downplaying the true nature of Redeker's disclosure obscures the lack of motive to combine. An even stronger example of the Examiner's mischaracterizations is found on page 7 of the Office Action dated 9/12/03. There, the Examiner interprets Ameen as merely failing to teach a remote plasma source. However, as described above in part A, Ameen actively teaches away from a remote plasma source by specifically pointing out the problems with such a source (Ameen at col. 2, ln. 54-62; col. 3, ln. 49-52) and expressly encouraging the exact opposite – a local plasma (*id.* at Abstract; col. 3, ln. 13-19; col. 9, ln. 1-21). Thus, a careful review of Ameen's actual teachings demonstrates that the Examiner's attempt to subsequently tack on Redeker's remote plasma source to Ameen's device is untenable. Such mischaracterizations further highlight the Examiner's failure to meet the *prima facie* burden for rejection.

2. The Examiner's unsupported inherency conclusions

Returning to the first example addressed above, Applicants note that the Examiner's interpretation of Redeker includes an assumption by the Examiner about what is inherent. There are still other instances where the Examiner announces what is inherent. (See Office Action dated 9/12/03 at p. 3, 8 (addressing claim 42).) Such instances demonstrate an additional flaw in the Examiner's reasoning. Namely, the Examiner's failure to support the inherency assumptions demonstrates a failure to abide by the standards set forth in binding case precedent, including *In re Zurko* (258 F.3d 1379, 59 U.S.P.Q.2d 1693 (Fed. Cir. 2001)). In *Zurko*, the Patent and Trademark Office (PTO) rejected Zurko's claims, admitting that the claim limitations were not explicitly disclosed by the cited art but announcing that the limitations were inherent based on the PTO's assumptions concerning the technology. (See *id.* at 1695.) In reversing the PTO, the Court held that the PTO "cannot simply reach conclusions based on its own understanding or experience." (*Id.* at 1697.) Rather, the Court required that the PTO "point to some concrete evidence in the record" to support its findings concerning aspects of the relevant technology. (*Id.*) The Court reasoned that to hold otherwise would render the process of appellate review a meaningless exercise. (*Id.* A copy of *Zurko* is included in an appendix to this Amendment and Response.)

The current facts are analogous: the Examiner has been unwilling or unable to cite express support for the assumptions concerning (1) prevention of inductive coupling in Redeker's or Ameen's devices (Office Action dated 9/12/03 at p. 3), (2) loss of the ability to generate plasma in Redeker's or Ameen's devices (*id.* at p. 3, 8), and (3) regaining such ability in Redeker's or Ameen's devices (*id.*); and the Examiner attempted to make up for this lack of citation by announcing that such properties are inherent. As a result, such conduct is an invitation for reversal by the Board or the Court for the same reasons as those provided in *Zurko*.

Similarly, the Examiner's (1) assumption that the remote plasma source of Redeker "may" have a tube configuration; and (2) unsupported announcement that such a configuration is conventional (Office Action dated 9/12/03 at p. 4, 8 (addressing claims 43-44)) are effectively admissions that Redeker fails to *expressly* disclose such. Absent that express teaching, the Examiner appears to be once again relying on matters deemed to be inherent. However, absent

the Examiner's citation to concrete evidence in the record supporting that inherent teaching, the rejection is unsupportable given *Zurko*'s rule. Even more on point regarding the Examiner's assumption is the case of *Crown Operations Intl. v. Solutia, Inc.* (289 F.3d 1367, 62 U.S.P.Q.2d 1917, 1923 (Fed. Cir. 2002)), wherein the Federal Circuit held that inherency cannot be established by probabilities or possibilities and that the "mere fact that a certain thing *may* result from a given set of circumstances is not sufficient" to establish the inherency of a teaching. (*Crown Operations*, 62 U.S.P.Q.2d at 1923 (citations omitted)(emphasis added).) The Board has also echoed this rule. (*Ex parte Herbermann*, 1997 WL 1935418 at 4 (Bd. Pat. App. & Interf. 1997) (citing *In re Oelrich*, 666 F.2d 578, 581, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981)). Copies of *Crown*, *Herbermann*, and *Oelrich* are included in appendices to this Amendment and response.) Such unsupported inherency arguments still further highlight the Examiner's failure to meet the *prima facie* burden for rejection.

3. The Examiner's mischaracterization of the claim limitations

The Examiner's reasoning also contains several instances of mischaracterizing the claim limitations, wherein such mischaracterizations further support the Examiner's failure to meet the *prima facie* burden for rejection.

For example, in attempting to reject claims 58, 61, and 62, the Examiner announced that "removing the wafer from the processing chamber during cleaning is considered a process limitation." (Office Action 9/12/03 at p. 5, 9.) Applicants assert that neither such a removing act nor any other act is expressed in these apparatus claims. Apparatus claim 58, for example, requires that an interior of claim 57's reactor is free of any wafer during a reactor cleaning mode. Applicants contend that such language addresses a physical property of a physical component -- namely, the load of the reactor. As a result, such language conveys a valid apparatus limitation having patentable weight in the apparatus claim.

Apparatus claim 61 requires that claim 60's furnace is configured to allow a gas to access a quartz tube to the exclusion of a wafer; and apparatus claim 62 requires that claim 61's furnace is configured to allow the gas to access the quartz tube in response to a removal of the wafer from the furnace. The plain language of the term "configured" demonstrates that such a term addresses a component's design, arrangement, set up, and/or shape. (AMERICAN HERITAGE

ELECTRONIC DICTIONARY (1992). A copy of the relevant definition is included in appendix to this Amendment and Response.) Hence, these limitations are also valid apparatus limitations having patentable weight in the apparatus claims. Accordingly, the Examiner's unsupported statements against claims 58, 61, and 62 concerning how a Redeker/Ameen modified device is capable of being used fail to support rejection (in addition to failing to meet *Zurko*'s requirements concerning citation to concrete evidence in the record).

Similarly, the Examiner attempted to characterize claim 59's expressed limitation as a process limitation. (Office Action 9/12/03 at p. 5, 9.) Apparatus claim 59, however, expresses that claim 58's chamber is configured to transmit a metal etchant in a non-plasma form to a reactor during a cleaning mode. Given the plain meaning of the term "configured" as addressed immediately above, Applicants contend that the expressed limitation is directed to the design, arrangement, set up, and/or shape of the chamber. As a result, claims 59's expressed limitation is a valid apparatus limitation having patentable weight; and the Examiner's statement concerning how a Redeker/Ameen modified device is capable of being operated should not be accorded weight, especially given the lack of citation to concrete evidence in the record (see *Zurko*).

Conclusion

Applicants note that the latest Office Action is a final Office Action, and Applicants therefore have no right to amend. However, Applicants contend that the amendment will place the application in condition for issuance. Accordingly, in light of the above remarks, Applicants respectfully request that the Examiner allow this amendment, withdraw the rejections, and allow the claims. Alternatively, Applicants request that the Examiner at least withdraw the finality of the latest Office Action in light of the above remarks. If there are any matters which may be resolved or clarified through a telephone interview, the Examiner is requested to contact Applicants' undersigned attorney at the number indicated.

Respectfully submitted,



Dated 10/20/13

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Appendix 1:
MPEP §609(III)(B)(2)(a)(i)&(ii)

Likewise, an information disclosure statement will be considered if it is filed later than 3 months after the application filing date but before the mailing date of a first Office action on the merits. An action on the merits means an action which treats the patentability of the claims in an application, as opposed to only formal or procedural requirements. An action on the merits would, for example, contain a rejection or indication of allowability of a claim or claims rather than just a restriction requirement (37 CFR 1.142) or just a requirement for additional fees to have a claim considered (37 CFR 1.16(d)). Thus, if an application was filed on January 2 and the first Office action on the merits was not mailed until 6 months later on July 2, the examiner would be required to consider any proper information disclosure statement filed prior to July 2.

(b) RCE and CPA

The 3-month window as discussed above does not apply to a RCE filed under 37 CFR 1.114 or a CPA filed under 37 CFR 1.53(d). An IDS filed after the filing of a RCE will be considered if the IDS is filed before the mailing date of a first Office action on the merits. A RCE is not the filing of an application, but merely the continuation of prosecution in the current application. After the mailing of a RCE, such application is treated as an amended application by the examiner and is subject to a short turnover time. Therefore, applicants are encouraged to file any IDS with the filing of a RCE. See MPEP § 706.07(h) for details on RCEs.

Similarly, an IDS filed in a CPA will be considered if the IDS is filed before the mailing date of a first Office action on the merits. Applicants are encouraged to file any IDS in a CPA as early as possible, preferably at the time of filing of the CPA request.

If an IDS cannot be filed before the mailing of a first Office action on the merits (generally within 2 months from the filing of the RCE or CPA), applicants may request a 3-month suspension of action under 37 CFR 1.103(c) in an application at the time of filing of the RCE, or under 37 CFR 1.103(b) in a CPA, at the time of filing of the CPA. Where an IDS is mailed to the Office shortly before the expiration of a 3-month suspension under 37 CFR 1.103(b) or (c),

applicant is requested to make a courtesy call to notify the examiner as to the IDS submission.

B (2)Information Disclosure Filed After B(1) but BEFORE Mailing of Final Action, Notice of Allowance, or an *Ex parte Quayle* Action (37 CFR 1.97(c))

An information disclosure statement will be considered by the examiner if filed after the period specified in subsection III.B(1) above, but prior to the date the prosecution of the application closes, i.e., before (not on the same day as the mailing date of any of the following:

a final action under 37 CFR 1.113, e.g., final rejection;

a notice of allowance under 37 CFR 1.311; or

an action that closes prosecution in the application, e.g., an *Ex parte Quayle* action,

whichever occurs first, provided the information disclosure statement is accompanied by either (1) a statement as specified in 37 CFR 1.97(e) (see the discussion in subsection III.B(5) below); or (2) the fee set forth in 37 CFR 1.17(p). If a final action, notice of allowance, or an *Ex parte Quayle* action is mailed in an application and later withdrawn, the application will be considered as not having had a final action, notice of allowance, or an *Ex parte Quayle* action mailed for purposes of considering an information disclosure statement.

An *Ex parte Quayle* action is an action that closes the prosecution in the application as referred to in 37 CFR 1.97(c). Therefore, an information disclosure statement filed after an *Ex parte Quayle* action, must comply with the provisions of 37 CFR 1.97(d).

(a) Information is Used in a New Ground of Rejection

i) Final Rejection is Not Appropriate

If information submitted during the period set forth in 37 CFR 1.97(c) with a statement under 37 CFR 1.97(e) is used in a new ground of rejection on unamended claims, the next Office action will not be made final since in this situation it is clear that applicant has submitted the information to the Office promptly after it has become known and the information is being submitted prior to a final determination on patentability by the Office.

ii) Final Rejection is Appropriate

The information submitted with a statement under 37 CFR 1.97(e) can be used in a new ground of rejection and the next Office action can be made final, if the new ground of rejection was necessitated by amendment of the application by applicant. Where the information is submitted during this period with a fee as set forth in 37 CFR 1.17(p), the examiner may use the information submitted, and make the next Office action final whether or not the claims have been amended, provided that no other new ground of rejection which was not necessitated by amendment to the claims is introduced by the examiner. See MPEP § 706.07(a).

B(3)Information Disclosure Statement Filed After B(2), but Prior to Payment of Issue Fee 37 CFR 1.97(d)

An information disclosure statement will be considered by the examiner if filed on or after the mailing date of any of the following: a final action under 37 CFR 1.113; a notice of allowance under 37 CFR 1.311; or an action that closes prosecution in the application, e.g., an *Ex parte Quayle* action, but before or simultaneous with payment of the issue fee, provided the statement is accompanied by:

- (A) a statement as specified in 37 CFR 1.97(e) (see the discussion in subsection B(5); and
- (B) the fee set forth in 37 CFR 1.17(p).

These requirements are appropriate in view of the late stage of prosecution when the information is being submitted, i.e., after the examiner has reached a final determination on the patentability of the claims presented for examination. Payment of the fee (37 CFR 1.17(p)) and submission of the appropriate statement (37 CFR 1.97(e)) are the essential elements for having information considered at this advanced stage of prosecution, assuming the content requirements of 37 CFR 1.98 are satisfied.

Form paragraph 6.52 may be used to inform the applicant that the information disclosure statement is being considered.

¶ 6.52 Information Disclosure Statement Filed After Prosecution Has Been Closed

The information disclosure statement (IDS) submitted on [1] was filed after the mailing date of the [2] on [3]. The submission is in compliance with the provisions of 37 CFR 1.97. Accord-

ingly, the information disclosure statement is being considered by the examiner.

Examiner Note:

1. In bracket 1, insert the date the IDS was filed.
2. In bracket 2, insert --final Office action--, --Notice of Allowance--, or an --*Ex parte Quayle* action-- as appropriate.

The requirements of 37 CFR 1.97 provide for consideration by the Office of information which is submitted within a reasonable time, i.e., within 3 months after an individual designated in 37 CFR 1.56(c) becomes aware of the information or within 3 months of the information being cited in a communication from a foreign patent office in a counterpart foreign application. This undertaking by the Office to consider information would be available throughout the pendency of the application until the point where the patent issue fee was paid.

If an applicant chose not to comply, or could not comply, with the requirements of 37 CFR 1.97(d), the applicant may file a RCE under 37 CFR 1.114, or a continuing application under 37 CFR 1.53(b) or (d) to have the information considered by the examiner. If the applicant files a continuing application under 37 CFR 1.53(b), the parent application could be permitted to become abandoned by not paying the issue fee required in the Notice of Allowance. If the prior application is a design application, or a utility or plant application filed before May 29, 2000, the filing of a continued prosecution application under 37 CFR 1.53(d) automatically abandons the prior application. See the discussion in subsection I. above under the heading "IDS IN CONTINUED EXAMINATIONS AND CONTINUING APPLICATION."

B(4)Information Disclosure Statement Filed After Payment of Issue Fee

After the issue fee has been paid on an application, it is impractical for the Office to attempt to consider newly submitted information. Information disclosure statements filed after payment of the issue fee in an application will not be considered but will merely be placed in the application file. See subsection C below. The application may be withdrawn from issue at this point, pursuant to 37 CFR 1.313(c)(2) or 1.313(c)(3) so that the information can be considered in the application upon the filing of a RCE under 37 CFR 1.114 or in a continuing application filed under 37 CFR 1.53(b) or 1.53(d). In this situation, a RCE, or a CPA

Appendix 2:

In re McLaughlin, 443 F.2d 1392, 170 U.S.P.Q. 209 (C.C.P.A. 1971)

In re McLaughlin
Court of Customs and Patent Appeals
No. 8474

Decided June 24, 1971

United States Patents Quarterly Headnotes

PATENTS

[1] Patentability -- Anticipation -- Combining references (§ 51.205)

Test for combining references is not what individual references themselves suggest but rather what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art.

PATENTS

[2] Patentability -- Invention -- In general (§ 51.501)

Any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into account only knowledge which was within level of ordinary skill at time claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, reconstruction is proper.

PATENTS

[3] Patentability -- Evidence of -- Commercial success -- In general (§ 51.4551)

Recognizing that inference of obviousness drawn from prior art disclosures is only *prima facie* justification for drawing ultimate legal conclusion that claimed invention is unpatentable under 35 U.S.C. 103, it is imperative that such secondary considerations as commercial success and adaptation by competitor also be evaluated in determining final validity of that legal conclusion; this is true even where claimed invention involves only relatively simple mechanical concepts.

PATENTS

Particular patents--Railway Cars

McLaughlin, Compartment Arrangement for Railway Cars, claim 15 of application allowed; claims 13 and 14 refused.

***210** Appeal from Board of Appeals of the Patent Office.

Application for patent of Gerald McLaughlin, Serial No. 566,701, filed July 5, 1966; Patent Office Group

317. From decision rejecting claims 13 to 15, applicant appeals. Affirmed as to claims 13 and 14; reversed as to claim 15.

Norman Lettin, Chicago, Ill., for appellant.

S. Wm. Cochran (R. V. Lupo of counsel) for Commissioner of Patents.

Before Rich, Almond, Baldwin, and Lane, Associate Judges, and Re, Judge, United States Customs Court, sitting by designation.

Baldwin, Judge.

McLaughlin has appealed from the decision of the Patent Office Board of Appeals sustaining the rejection of claims 13, 14 and 15 in his application [FN1] as unpatentable under 35 U.S.C. 103 in view of the prior art. One claim has been held allowable.

The Invention

The subject matter of the claims on appeal may be characterized as an improved construction arrangement for railroad "boxcars" which are adapted for carrying "unitized" cargo. The latter term is defined by appellant as "cargo that is loaded upon a cargo-handling platform (such as a pallet or slip sheet) of a pre-selected size, and which is arranged for transfer between stations by devices such as fork-lift trucks."

Appellant states that prior art arrangements, having the doorways located substantially centrally in the opposed sidewalls, leave the center of the car unsuitable for holding additional pallets securely because side filler panels cannot be placed over the doorways without inconveniencing loading and unloading.

The present invention, as represented in Figure 2 of the application, which we reproduce below along with Figure 3, is alleged to permit a larger volume of freight to be conveniently loaded in a car with the same overall dimensions.

Image 1 (1.5 X 4) Available for Offline Print

***211**

Image 2 (2.5 X 3.25) Available for Offline Print

The car used in this arrangement has the door

openings 39 (left hand occurrence) and 40 in the opposite sidewalls offset longitudinally so that each sidewall includes a long wall section and a short wall section on opposite sides of the opening. Side filler panels 43 and 45 are affixed to the interiors of the long wall sections 37 and 34, respectively, and longitudinally adjustable bulkheads 47 and 48 are provided. The car is shown completely filled with groups of palletized containers 51 and 52, secured in position by the side filler panels and bulkheads. The application describes the loading of this car as follows:

Typically, the load dividers 47 and 48 are initially moved to the left of doorway 40 to permit free access to the floor surface area in the "deep end" of the car bounded by end wall 30. The pallets 51 are placed into the car in sequence, adjusting the side fillers to the necessary width required to firmly confine the pallets in place. During this time, door 49 is already closed to form the lateral support for the six pallet stacks 51 nearest load divider 48. The load divider 48 is then moved into position against the stacked pallets 51 and locked in place. The second load divider 47 is then temporarily positioned closely adjacent load divider 48 to permit free access to the "short end" of the car terminated by end wall 31. Pallets 52 are then sequentially placed in position, adjusting the side fillers 45 to retain these pallets against lateral shifting. The three side fillers in the series 45 which are closest to the load divider 47 are preadjusted prior to loading the six pallet stacks 52 nearest load divider 47. Finally, load divider 47 is moved into tight engagement with the stacked pallets 52, locked in place, and the door 50 is closed to secure the pallets 52.

The only independent claim on appeal is claim 13 which we reproduce as follows:

13. An improved car-loading construction for use in elongated, wall- enclosed railway cars of the type utilizing therein longitudinally movable load- confining transverse bulkheads which are adapted to be located generally centrally of the ends of the car to project across substantially the entire width of the car;

said improved car-loading construction comprising, in combination,

the longitudinal side walls of the car each having a single doorway therein located between the ends of the wall to divide the wall into spaced long and

short sections,

the doorways being offset toward different ends of the car so that the major portion of each doorway is directly opposite the long wall section of the opposing side wall, and

side filling panels mounted on the inside surface of each of said long wall sections and being adjustable toward and away from the corresponding long wall section, so that the transversely adjustable side filling panels on one long wall section and a longitudinally adjustable transverse bulkhead may cooperate to substantially fully enclose the load in one end of the car substantially to the mid-point of the car without adversely affecting the ability to load the other end of the car.

Claim 14 adds the additional limitations that the car is adapted to carry pallet-mounted loads and the lengths of the side walls of the car conform substantially to whole multiples of a dimension of a pallet. Claim 15 further provides that the portion of each doorway directly opposite a wall is "substantially equal *212 to a plural multiple of a dimension of the pallet" and that the rest of the doorway is narrower than a pallet dimension.

The Rejection

Claims 13, 14 and 15 were rejected as unpatentable over Cook [FN2] in view of either Robertson [FN3] and Aquino [FN4] or of Lundvall, [FN5] under 35 U.S.C. 103.

Cook discloses a railway box car having sides defining oversized door openings in diagonally opposite ends of the car. That construction is described as facilitating loading and unloading lumber, permitting it to be palletized and to be handled by lift trucks.

Lundvall discloses a railway car provided with adjustable side filler panels for preventing lateral shifting of the load and adjustable bulkheads to hold the load against longitudinal shifting.

Robertson discloses a specific side filler panel construction for railway cars and Aquino is directed to a bulkhead construction for similar use.

The examiner and board based their holdings that the appealed claims are unpatentable on the view that persons of ordinary skill in the art would find it

obvious to use bulkheads and side filler panels, as disclosed in the secondary references, in connection with loads placed in a car of the Cook construction.

Opinion

Appellant has strenuously urged that the reference disclosures were improperly combined. In particular, with regard to Cook, he argues that, while the reference does show elongated, longitudinally offset doors, it does not suggest such an arrangement *in combination* with a bulkhead and side fillers because of the patentee's expressed desire to have a car capable of being loaded and unloaded simultaneously from both sides, which is not the desire of appellant nor even possible, he urges, with his arrangement.

[1] We have taken the above argument into consideration and do find that it has some merit. Nevertheless, it is not convincing. It should be too well settled now to require citation or discussion that the test for combining references is not what the individual references themselves suggest but rather what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the

[2] art. Any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper. The Cook patent does indicate that the car shown therein is suitable for carrying palletized loads with lift trucks being used for the loading and unloading, including stacking of the pallets. Since the secondary references show that it was well known to use side filler panels and bulkheads to confine palletized loads to prevent lateral and longitudinal shifting, we agree that those references would have suggested use of such panels and bulkheads with the Cook car for the same purpose.

[3] The foregoing conclusion in itself, however, is not determinative of the present appeal. Appellant has submitted evidence tending to prove that his invention has solved the longstanding problem of utilizing the maximum amount of space in standard, 50-ft. boxcars, permitting loading the car with 56 pallets of 48" x 40", whereas prior to the invention, cars of that size could be loaded with only 46 such pallets properly confined. The evidence, comprising two affidavits and a series of exhibits, indicates that

the invention has been commercially successful and that its concept was promptly adapted by a competitor. Recognizing that the inference of obviousness drawn from the prior art disclosures is only *prima facie* justification for drawing the ultimate legal conclusion that the claimed invention is unpatentable under 35 U.S.C. 103, it is imperative that such secondary considerations also be evaluated in determining the final validity of that legal conclusion. *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). We emphasize that such is true even where, as here, the claimed invention involves only relatively simple mechanical concepts. As we have said on another occasion: "A patentable invention, within the ambit of 35 U.S.C. 103, *may* result even if the inventor *has*, in effect, merely combined features, old in the art, for their known purpose, without producing anything beyond the results inherent in their use." *In re Sponnoble*, 56 CCPA 823, 405 F.2d 578, 160 USPQ 237 (1969).

The first affidavit was by appellant, himself, the manager of the Customer Relations Department of the Equipco division of Unarco Industries, Inc., the assignee of the application. He asserts that 355 railway cars *213 equipped for use with his invention, valued at nearly eight million dollars, were ordered within little more than a year. Included with this affidavit are a series of reproductions of trade journal articles and advertisements tending to support the further assertion made in the affidavit, that the problem of effectively utilizing space was a familiar one. One exhibit is a copy of the advertisement of a competitor, tending to indicate that appellant's concept was adopted by that competitor. The other affidavit is by John Clement, general traffic manager with the Corn Products Co. and apparently a disinterested third party. The affiant states that he has the duty of obtaining all the railroad and other types of cargo equipment necessary for shipping the company's products and that he became interested in the invention immediately upon its being disclosed to him because it appeared to solve problems presented by prior railway car arrangements, allowing use of substantially the entire cargo carrying capacity of the car while permitting truck loading. The affidavit further states that Corn Products had already received 10 cars possessing the proposed arrangement, had ordered 11 more and was negotiating for an additional forty.

The examiner did not consider the affidavits persuasive. That of Clement he characterized as alleging that appellant's arrangement is more versatile than prior arrangements without advancing any factual

support. He regarded appellant's own affidavit as lacking sufficient facts to show that the asserted commercial success resulted from the invention as claimed. The board did not comment on either affidavit in its opinion.

Our own consideration of the affidavits in light of appellant's arguments convinces us that there was a problem in the art due to floor space in the mid-section of cars with side doorways not ordinarily being usable for palletized goods which require securing against transverse and lateral shifting. Moreover, the favorable opinion Clement expressed of the invention and the showing of extensive purchases of equipment for utilizing it indicate that appellant provided an unobvious solution of the problem. The affidavits reveal the solution as involving the arrangement substantially as described in applicant's application. Thus an arrangement is required wherein the relationship of the dimensions of the long and short wall sections and the door openings of the car are such that the pallets may be machine-loaded substantially to its full capacity. We note that these features are brought out fully only in claim 15 which recites that the long and short sections of the side walls are substantially equal to whole multiples of a dimension of a pallet and that the portions of the doorway directly opposite each other have a width equal to a plural multiple of a dimension of a pallet. As to that claim, we find appellant's secondary evidence adequate to rebut the initial inference of obviousness and, accordingly, reverse the decision of the board.

On the other hand, the affidavit showings do not demonstrate that an arrangement lacking any of the characteristics defined in claim 15 solved the previous space-utilization problem or that the commercial success was due to less than all of those features. As to claims 13 and 14, thus, the *prima facie* case of obviousness made out by the prior art stands unrebutted and the board's decision pertaining thereto must be sustained.

The decision of the board is *affirmed* as to claims 13 and 14 and *reversed* as to claim 15.

FN1 Serial No. 566,701, filed July 5, 1966, for "Compartment Arrangement for Railway Cars."

FN2 Patent No. 2,930,332, granted March 29, 1960.

FN3 Patent No. 3,212,458, granted October 19, 1965.

FN4 Patent No. 3,217,664, granted November 16, 1965.

FN5 Patent No. 3,163,130, granted December 29, 1964.

Cust. & Pat.App.

170 U.S.P.Q. 209

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Appendix 3:

In re Young, 927 F.2d 588, 18 U.S.P.Q.2d 1089 (Fed. Cir. 1991)

In re Young

Court of Appeals, Federal Circuit

No. 90-1368

Decided March 5, 1991

United States Patents Quarterly Headnotes

PATENTS

[1] Patentability/Validity - Obviousness - Relevant prior art - In general (§ 115.0903.01)

Apparently conflicting prior art references must, in making obviousness determination, each be weighed for their power to suggest solutions to artisan of ordinary skill, and all disclosures in prior art must be considered to extent that they are in analogous fields of endeavor and thus would have been considered by person of ordinary skill in field of invention; in weighing suggestive power of each reference, degree to which one reference might accurately discredit another must be considered.

PATENTS

[2] Patentability/Validity - Obviousness - Relevant prior art - Particular inventions (§ 115.0903.03)

Applicant's claims for method of generating seismic pulse in water by use of at least three air guns disposed at critical distance from each other are obvious in view of prior patent which expressly teaches exact spacing set forth as limitation in each of applicant's claims, even though additional reference purporting to test different methods of pulse generation suggests avoidance of spacing taught in prior patent, since reference did not accurately test prior patent according to its teachings, particularly those regarding spacing, and therefore artisan of ordinary skill would have afforded reference little weight.

***1090** Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of D. Raymond Young and John C. Wride (method and apparatus for generating an acoustic pulse in a body of water). From decision of Board of Patent Appeals and Interferences upholding final rejection of all claims, applicants appeal. Affirmed.

Richard F. Phillips, Jr., Houston, Texas, for appellants.

Lee E. Barrett, associate solicitor (Fred E. McKelvey, solicitor, with him on brief), Arlington, Va., for appellee Patent and Trademark Office.

Before Newman, Lourie, and Rader, circuit judges.

Rader, J.

Raymond Young and his co-inventor John Wride (collectively Young) appeal from the October 31, 1989 and April 18, 1990 decisions of the Board of Patent Appeals and Interferences (Board). These decisions affirmed the final rejection of all claims in their application. The Board held Young's claimed invention obvious under 35 U.S.C. §103. This court affirms.

BACKGROUND

Young's application discloses a method and apparatus for generating an acoustic pulse in water. Acoustic pulse technology facilitates offshore seismic exploration. The acoustic pulse generates a large gas bubble in the ocean above geological formations on the ocean floor. The rapid expansion and collapse of the gas bubble create a shock wave in the water. The shock wave propagates through the water into the formations below the ocean bed. As the shock wave passes downward through these formations, each interface between adjoining earth strata reflects a portion of the shock wave. These reflections move upward through the ocean. Hydrophones at the ocean's surface can monitor these reflections. From these monitored reflections, geologists can generate a "seismic section" map which shows the configuration of strata in the ocean bed.

Today's most common sources of seismic shock waves are air guns. These air guns feature a chamber for storing and releasing on command highly compressed air. A high-pressure hose charges the gun with compressed air for rapid firing during a seismic survey.

Acoustic pulse technology suffers from problems with bubble oscillation. Upon release of the compressed air, the bubble undergoes a rapid initial expansion and collapse. Several more expansions and collapses follow the initial collapse, but with diminishing amplitude. Each of these expansion-collapse events creates an additional shock wave. The geological strata reflect each of these additional shock waves. The

multiple reflections, in turn, blur the resolution of the seismic section. Most blurring comes from the first oscillation after the initial bubble collapse.

Acoustic pulse technology uses a "primary-to-bubble ratio" to measure susceptibility to oscillation. This ratio compares the shock wave intensity of the initial expansion-collapse to the intensity of the first oscillation. A high ratio means the secondary shock waves are less likely to blur the seismic section.

Young tries to raise the primary-to-bubble ratio above prior art air gun sources by reducing the amplitude of the first oscillation. Young seeks this result by spacing at least three air guns in a characteristic array. The array separates the guns from each other by a critical distance. The distance, D, is at least 1.2 times greater than R, but less than or equal to twice R. R is the maximum radius of the initial air bubble from each gun. [FNa1] With this spacing, the bubbles from each gun intersect before any single bubble reaches its maximum radius. This intersection dampens the overall oscillation. Young's independent claims each include a spacing limitation within this range.

Independent claim 1 is illustrative: A method of producing a seismic pulse in a body of water, including the steps of:

(a) disposing in the water a set of at least three air guns, each adapted to produce in the water a gas bubble having maximum radius substantially equal to the quantity R, where the guns are disposed at depths such that each produces, when fired, a bubble of maximum radius R, and the guns are disposed such that each gun is separated from each of the nearest guns thereto in the set by a critical distance, D, where D is substantially equal to $V 2R$; and

(b) firing the air guns substantially simultaneously to produce a seismic pulse in the water.

***1091** Young's dependent claims define the number of the guns or their placement relative to each other or to the ocean surface.

The examiner rejected each of the claims as obvious under 35 U.S.C. §103 in light of five prior art references. The examiner relied primarily on U.S. Patent No. 2,619,186 to Carlisle (the "Carlisle patent" or "Carlisle") to reject Young's claims. Carlisle is the only reference cited by the examiner or Board which suggests the air gun spacing in Young's claims.

Young contested the Board's and the examiner's consideration of Carlisle. Young argued that Carlisle concerns reducing bubble oscillation for chemical explosives, not air guns. Young also argued that an article by Knudsen published six years after Carlisle in the journal *Geophysics* expressly discredits the teachings of Carlisle. W. Knudsen, *Elimination of Secondary Pressure Pulses in Offshore Exploration (A Model Study)*, 23 *Geophysics* No. 3 at 440 (July 1958) (Knudsen). Therefore, Young contended, a person of ordinary skill in the seismic exploration art would not have considered Carlisle when developing an improved seismic array.

The Board rejected Young's arguments. The Board held that the examiner appropriately applied Carlisle notwithstanding the teachings of Knudsen. On appeal, Young asserts as error only the propriety of applying Carlisle as a reference in light of Knudsen's allegedly contrary teachings.

DISCUSSION

This court must decide whether the Board properly affirmed the examiner's rejection over Carlisle. Young has not challenged the other references cited in the examiner's rejection. Further, Young has not argued the merits of any particular claim apart from the others. Therefore, all claims stand or fall together with representative independent claim 1. *See In re Kaslow*, 707 F.2d 1366, 1376, 217 USPQ 1089, 1096 (Fed. Cir. 1983).

The Carlisle patent - "Seismic Exploration Method" - issued on November 25, 1952. Carlisle concerns minimizing bubble oscillation for chemical explosives used in marine seismic exploration. Carlisle controls bubble oscillation by spacing seismic sources to achieve a reduction of the secondary pressure pulse. Carlisle specifically teaches spacing the seismic sources close enough to allow the bubbles to intersect before reaching their maximum radius. Carlisle spaces the bubble centers closer than two maximum bubble radii, or less than "2.0 R" in Young's notation. Carlisle, col. 3, lines 57-60. Carlisle explains:

[T]he secondary energy normally available from these sources is dissipated by their mutual intersection and tends to eliminate the secondary seismic impulses created when the walls of the bubbles collapse.

Id. at lines 60-64. Thus, Carlisle expressly teaches the spacing limitation in each of Young's claims.

Notwithstanding Carlisle's teachings, Young argues that the Knudsen article discredits Carlisle. Knudsen describes a series of tests which evaluated four proposed techniques for suppressing bubble oscillation. Carlisle was one of the four. Knudsen's article opined that Carlisle yields no appreciable improvement in bubble oscillation suppression. The effective teaching of the Knudsen/Carlisle combination, Young argues, suggests avoidance of the spacing suggested in Carlisle. Therefore, Young would have this court conclude that his use of Carlisle's spacing would not have been obvious.

Young misunderstands the effect that Knudsen has on Carlisle. The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). Even if tending to discredit Carlisle, Knudsen cannot remove Carlisle from the prior art. Patents are part of the literature of the art and are relevant for all they contain. *In re Lemelson*, 397 F.2d 1006, 1009, 158 USPQ 275, 277 (CCPA 1968). For example, in *In re Etter*, 756 F.2d 852, 859, 225 USPQ 1, 6 (Fed. Cir.), cert. denied, 474 U.S. 828 (1985), a reference which disclosed obsolete technology remained in the prior art. This court considered the reference for what it disclosed in relation to the claimed invention.

[1] When prior art contains apparently conflicting references, the Board must weigh each reference for its power to suggest solutions to an artisan of ordinary skill. The Board must consider all disclosures of the prior art, *In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976), to the extent that the references are, as here, in analogous fields of endeavor and thus would have been considered by a person of ordinary skill in the field of the invention. The Board, in weighing the suggestive power of each reference, must consider the degree to which one reference might accurately discredit another.

[2] As prior art, the Board correctly weighed Carlisle to determine the patentability of Young's claims. Carlisle expressly teaches both the method and the advantages *1092 of Young's claimed spacing. In fact, Carlisle expressly teaches the exact spacing set out as a limitation in Young's claims. Thus, the Board correctly attributed significant weight to Carlisle in its obviousness determination.

In determining what weight to accord to Carlisle as prior art, the Board also appropriately considered

Knudsen's discrediting effect. The Board determined that Knudsen did not convincingly discredit Carlisle. Therefore, the Board appropriately concluded that Knudsen would not have led one skilled in the art to reject Carlisle.

Knudsen did not test Carlisle according to its teachings. For instance, Knudsen did not use an explosive charge in modeling Carlisle. Rather, Knudsen tried to simulate Carlisle with a capacitive electrical discharge in a barrel of oil.

Knudsen did not replicate Carlisle's teachings on spacing. Knudsen tried to model Carlisle by separating the seismic sources by one, two and three bubble radii. Knudsen at 42. At the maximum spacing of three bubble radii, the bubbles will not intersect at all. Carlisle specifically requires spacing to permit bubble intersection. Carlisle, col. 4, lines 47-52. At a spacing of one bubble radius, the two bubbles coalesced into one before the initial collapse. Knudsen at 45. If just one bubble is present, the bubble will oscillate as if no second seismic source was present. Carlisle specifically requires spacing to prevent the formation of one bubble. Carlisle, col. 4, lines 34-37. Finally, at the two bubble radii spacing in Knudsen, the bubbles will just barely intersect. Carlisle requires that the bubbles intersect before each bubble achieves its maximum radius. Carlisle, col. 3, lines 58-60. In sum, Knudsen did not duplicate or appropriately model Carlisle's spacing.

Knudsen's conclusion that Carlisle would "not be effective in eliminating the secondary pressure pulse" also directly contradicts data contained in Knudsen. The Knudsen data point for the two-radii horizontal bubble spacing, although not a completely accurate model of Carlisle, shows a 30% reduction of the secondary pressure pulse. Knudsen at 45, Table 4. This data point represents the only point where Knudsen approximates the spacing shown in Carlisle. At that point, Knudsen confirmed Carlisle's teachings.

The Board found that Knudsen "did not test the Carlisle technique under conditions which are directly comparable to the Carlisle disclosure." Weighing the discrepancies between the Knudsen model and Carlisle's teachings, as well as Knudsen's tendency to confirm Carlisle where the model approximated Carlisle, the Board concluded: "we do not agree that Knudsen discredits Carlisle."

Because Knudsen did not accurately test Carlisle, an artisan of ordinary skill would not have dismissed

Carlisle in light of Knudsen as a whole. It is far more likely that the skilled artisan would have afforded little weight to Knudsen itself. The Board did not err in relying on Carlisle and discounting Knudsen.

CONCLUSION

Knudsen is not so credible or persuasive of a contrary teaching that it would have deterred the skilled artisan from using the teachings of Carlisle. The examiner's use of Carlisle in his rejection of Young's claims is not

clearly erroneous. The Board's decision affirming the examiner's rejection is therefore *AFFIRMED*.

FN1 Mathematically, D is defined by $1.2 R \leq D \leq 2.0 R$.

C.A.Fed.

18 U.S.P.Q.2d 1089

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Appendix 4:

In re Zurko, 258 F.3d 1379, 59 U.S.P.Q.2d 1693 (Fed. Cir. 2001)

In re Zurko

U.S. Court of Appeals Federal Circuit

No. 96-1258

Decided August 2, 2001

PATENTS

[1] Patentability/Validity -- Obviousness -- Combining references (§ 115.0905)

JUDICIAL PRACTICE AND PROCEDURE

Procedure -- Judicial review -- Standard of review -- Patents (§ 410.4607.09)

Decision of Board of Patent Appeals and Interferences sustaining obviousness rejection of patent application for method of improving security in computer system is reversed, even though board's factual findings underlying its determination are reviewed under "substantial evidence" standard, since prior art references relied upon by board do not teach limitation requiring communications between user and "trusted" environment along "trusted" path, and since deficiencies of references cannot be remedied by reliance upon additional combination of alternative references cited for first time on appeal, or by board's general conclusion, unsupported by evidence in record, that requiring communication with trusted environment over trusted path would be "basic knowledge" or "common sense" to person of ordinary skill in art; although board's expertise alone may provide sufficient support for conclusions as to peripheral issues, its core factual findings in patentability determinations must be supported by concrete evidence in record.

On remand from the U.S. Supreme Court.

Patent application of Mary E. Zurko, Thomas A. Casey Jr., Morie Gasser, Judith S. Hall, Clifford E. Kahn, Andrew H. Mason, Paul D. Sawyer, Leslie R. Kendall, and Steven B. Lipner, serial no. 07/479,666 (method for improving security in a computer system). Board of Patent Appeals and Interferences sustained examiner's rejection of application under 35 U.S.C. § 103. The U.S. Court of Appeals *1694 for the Federal Circuit reversed on appeal (42 USPQ2d 1476). On rehearing en banc, the Federal Circuit held (46 USPQ2d 1691) that proper standard of review for fact findings underlying patentability determinations by Patent and Trademark Office is "clearly erroneous" standard, rather than more deferential standard found

in Administrative Procedure Act. The U.S. Supreme Court reversed the Federal Circuit's en banc decision and remanded, holding (50 USPQ2d 1930) that PTO's findings of fact must be reviewed under either "substantial evidence" or "arbitrary and capricious" APA standards of review. On remand, the Federal Circuit again reverses board's decision.

Linda Moncys Isacson, associate solicitor, John M. Whealan, solicitor, and Kenneth R. Corsello and Thomas J. Finn, associate solicitors, U.S. Patent and Trademark Office, Arlington, Va., for Commissioner of Patents and Trademarks.

John F. Sweeney, Michael O. Cummings, Jon T. Hohenthaler, Israel Blum, Steven F. Meyer, and Brenda Pomerance, of Morgan & Finnegan, New York, N.Y.; Irene Kosturakis and Russell T. Wong, of Compaq Computer Corp., Houston, Texas; Ernest Gellhorn, Washington, D.C.; Janice M. Mueller, of Suffolk University Law School, Boston Mass.; Ronald C. Hudgens, of Digital Equipment Corp., Maynard, Mass., for Mary E. Zurko et al.

Before Newman, circuit judge, Archer, senior circuit judge, and Michel, circuit judge.

Archer, S.J.

This case is before us on remand from the Supreme Court of the United States. *Dickinson v. Zurko*, 527 U.S. 150, 50 USPQ2d 1930 (1999) ("Zurko III"). In *Zurko III*, the Court reversed our judgment and remanded the case because we had reviewed the factual findings of the Board of Patent Appeals and Interferences ("Board") for clear error, an incorrect standard of review.

The Board decision at issue, *Ex parte Zurko*, No. 94-3967 (Bd. Pat. Apps. & Int. Aug. 4, 1995), sustained the rejection of U.S. Patent Application No. 07/479,666 ("the '666 application") under 35 U.S.C. § 103 (1994). In our initial review of this decision, we determined that the Board's findings were clearly erroneous and we reversed. *In re Zurko*, 111 F.3d 887, 42 USPQ2d 1476 (Fed. Cir. 1997) ("Zurko I"). At the Commissioner's suggestion, we then reheard this case en banc to reconsider the question of the appropriate standard of review. The Commissioner argued that Board findings should be reviewed under the standards of the Administrative Procedure Act (APA), namely the substantial evidence or arbitrary and capricious

standard. 5 U.S.C. § 706 (1994). The en banc court held, however, that clear error was the correct standard of review for Board findings of fact and adopted the conclusions of the original panel decision. *In re Zurko*, 142 F.3d 1447, 46 USPQ2d 1691 (Fed. Cir. 1998) ("Zurko II").

The Commissioner then petitioned for review by the Supreme Court, and the Court reversed, holding that Board findings of fact must be reviewed under the APA standards of review. The Court did not specify which APA standard of review to apply, substantial evidence or arbitrary and capricious. We subsequently decided this question in *In re Gartside*, 203 F.3d 1305, 53 USPQ2d 1769 (Fed. Cir. 2000), and held that substantial evidence is the correct APA standard of review for Board factual findings.

We now revisit the merits of our decision in *Zurko I*, applying the proper APA standard of review. In doing so, we conclude that the outcome of this case does not change with the application of this new standard of review. Because the factual findings underlying the Board's decision are not supported by substantial evidence, we reverse.

BACKGROUND

The '666 application concerns a method for more efficiently creating a secure computer environment. Secure, or "trusted," computer environments employ trusted software designed to preclude unauthorized users and to prevent unintended or unauthorized commands. Such trusted software is often quite costly, compared to untrusted software, so it is desirable to minimize the amount of trusted software in the system. Applicants claim a method for processing trusted commands with a minimum of trusted software.

Representative claim one reads as follows:

1. A machine-executed method for executing a trusted command issued by a user on a computer system, the computer system including an untrusted computing environment and a trusted computing environment, said method comprising the steps of:

*1695 (a) parsing the trusted command in the untrusted computing environment to generate a parsed command;

(b) submitting the parsed command to the trusted computing environment;

(c) displaying a representation of the trusted command to the user through a trusted path;

(d) receiving a signal from the user through a trusted path signifying whether the displayed representation accurately represents the user's intentions;

(e) if the signal signifies that the displayed representation does not accurately represent the user's intentions, then preventing the execution of the parsed command;

(f) if the signal signifies that the displayed representation accurately represents the user's intentions, executing the parsed command in the trusted environment.

As set forth in claim one, applicants' method involves processing and verifying a trusted command using both trusted and untrusted software. A trusted command is first processed by untrusted software to create a parsed command. The parsed command is then submitted to the trusted computer environment. Execution of this command requires verification along a trusted path. The parsed command is relayed to the user along a trusted path, and, if correct, the user can send a confirming signal back along this trusted path, allowing execution of the command. By processing a trusted command in this manner, the applicants contend they reduce the amount of trusted software. The applicants assert that the parsing step generally requires a large amount of software and that performing this step with untrusted software greatly reduces the amount of trusted code required to process a trusted command.

The Board sustained the Examiner's rejection of claims 1, 4, and 5 of the '666 application under 35 U.S.C. § 103 based on two prior art references. The primary reference is the UNIX operating system, as described in the applicants' information disclosure statement ("IDS"). According to this description, the UNIX system employs both untrusted and trusted code. Furthermore, certain commands in a UNIX system may be parsed in an untrusted environment, and then these parsed commands may be executed by "calling a trusted service that executes in a trusted computing environment."

The secondary reference, also described in applicants' IDS, is Dunford, FILER Version 2.20 ("FILER2"). This program repeats back potentially dangerous commands, requesting confirmation from the user before execution.

Considering the teachings of these two references, the Board concluded that the invention claimed by the '666 application would have been obvious. The Board commented that "the artisan would have been led from these teachings to take the trusted command parsed in an untrusted environment and submitted to the trusted computing environment, as taught by UNIX, and to display the parsed command to the user for confirmation prior to execution, as suggested by [FILER2]." *Ex parte Zurko*, slip op. at 6-7. According to the Board, this combination would render the claimed invention obvious.

The Board also responded to applicants' arguments that neither reference discloses a trusted path communication to the user and that no teaching of the prior art references motivates the combination of these references to create the claimed invention. The Board said that communication along a trusted path, if not explicit in the prior art, is either inherent or implicit. *Id.* at 7. The Board further adopted the Examiner's assertion that "it is basic knowledge that communication in trusted environments is performed over trusted paths." *Id.* at 8. As for the motivation to combine these references, the Board concluded that it "would have been nothing more than good common sense" to combine the teachings of these references. *Id.* The Board noted that FILER2 taught the verification of dangerous commands in general, suggesting verification of the parsed command submitted to the trusted computing environment in UNIX. Because this verification occurs within a trusted environment, it is "basic knowledge," according to the Board, that this verification would occur along a trusted path. *Id.* at 7-8.

Reviewing the Board's decision in *Zurko I*, we held that "the Board's finding that the prior art teaches, either explicitly or inherently, the step of obtaining confirmation over a trusted pathway [was] clearly erroneous." *Zurko I*, 111 F.3d at 889, 42 USPQ2d at 1478. Indeed, we noted that neither reference relied upon by the Board taught communication with *1696 the user over a trusted pathway. *Id.*, 42 USPQ2d at 1479. We further held that the Board clearly erred in finding that the prior art teaches communicating with the user over both a trusted and an untrusted path. This finding was in conflict with the Board's other finding that trusted communications must be over trusted paths. *Id.* at 890, 42 USPQ2d at 1479.

On remand, applicants urge that we maintain our reversal of the Board's decision, arguing that the decision is legally flawed, or, alternatively, that the

Board's factual findings fail under the APA standard of review. The Commissioner responds that we must affirm the Board decision because its findings are supported by substantial evidence in the record.

DISCUSSION

A claimed invention is unpatentable for obviousness if the differences between it and the prior art "are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103(a) (1994); *Graham v. John Deere Co.*, 383 U.S. 1, 14, 148 USPQ 459, 465 (1966). Obviousness is a legal question based on underlying factual determinations including: (1) the scope and content of the prior art, including what that prior art teaches explicitly and inherently; (2) the level of ordinary skill in the prior art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness. *Graham*, 383 U.S. at 17-18, 148 USPQ at 467; *In re Dembiczak*, 175 F.3d 994, 998, 50 USPQ 1614, 1616 (Fed. Cir. 1999); *In re Napier*, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995) (stating that the inherent teachings of a prior art reference is a question of fact). We review the ultimate legal determination of obviousness without deference. *In re Dembiczak*, 175 F.3d at 998, 50 USPQ at 1616. We review factual findings underlying this determination for substantial evidence. *In re Gartside*, 203 F.3d at 1311-16, 53 USPQ2d at 1772-75.

Substantial evidence is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938); *see also Zurko III*, 527 U.S. at 162, 50 USPQ2d at 1772-75. A review under this standard "involves an examination of the record as a whole, taking into consideration evidence that both justifies and detracts from the agency's decision." *In re Gartside*, 203 F.3d at 1312, 53 USPQ2d at 1773 (citing *Universal Camera Corp. v. NLRB*, 340 U.S. 474, 487-88 (1951)). In addition, "the possibility of drawing two inconsistent conclusions from the evidence does not prevent an administrative agency's finding from being supported by substantial evidence." *Consolo v. Fed. Maritime Comm'n*, 383 U.S. 607, 619-20 (1966).

The substantial evidence standard has been analogized to the review of jury findings, and it is generally considered to be more deferential than the clearly erroneous standard of review. *Zurko III*, 527 U.S. at 162-63, 50 USPQ2d at 1936. The Supreme

Court noted in *Zurko III*, however, that this generally recognized difference is "a subtle one," so fine that in its review of case law in the *Zurko III* decision, the Court could not find any other case where a reviewing court had conceded that the standard of review made a difference. *Id.* Moreover, while appellate courts must respect agency expertise, the Court has "stressed the importance of not simply rubber-stamping agency fact finding." *Id.* (citing *Universal Camera*, 340 U.S. at 477-78). Indeed, the Court observed that Federal Circuit judges "will examine [Board fact] findings through the lens of patent-related experience -- and properly so, for the Federal Circuit is a specialized Court." *Id.* The Court further noted that this "comparative expertise, by enabling the Circuit better to understand the basis for the [Board's] finding of fact, may play a more important role in assuring proper review than would a theoretically somewhat stricter standard." *Id.*

With this guidance from the Supreme Court in mind, we now reconsider the Board's decision. Applicants urge that we reaffirm our conclusion in *Zurko I*, alleging numerous legal and factual errors in the Board decision. These arguments center around two issues. First, applicants argue that the prior art relied upon by the Board does not disclose one of the limitations of their claimed invention, namely communication between a trusted environment and the user along a trusted path. Second, applicants claim that there is no substantial evidence support for the Board's finding of motivation to combine the cited references to yield the claimed invention. We only need to consider the first issue raised by applicants.

As to this first issue, the Commissioner apparently concedes that neither the UNIX IDS disclosure nor FILER2 teaches communications between the user and the trusted environment along a trusted path. Nevertheless, the Commissioner maintains that the Board's findings concerning the content of the prior art are supported by four other references in the record. [FN1][1] As to this first issue, the Commissioner apparently concedes that neither the UNIX IDS disclosure nor FILER2 teaches communications between the user and the trusted environment along a trusted path. Nevertheless, the Commissioner maintains that the Board's findings concerning the content of the prior art are supported by four other references in the record. [FN1] The Commissioner argues that these additional references describe modified UNIX systems that allow communication over both trusted and untrusted paths. Therefore, the Commissioner argues, the

Board's general findings concerning the content of the prior art have substantial evidence support, as does its ultimate conclusion of obviousness.

We are unpersuaded by the Commissioner's arguments. The Board's conclusion of obviousness was based on the UNIX and FILER2 references. The Board's findings with respect to these references simply cannot be supported by the alternative references identified by the Commissioner on remand. To the contrary, these alternative references merely confirm the well-known fact that conventional UNIX systems do not allow communication between the user and the trusted environment along a trusted path. For example, Johrie et al., U.S. Pat. No. 4,918,653, comments that "[s]ome examples of prior art multi-user operating systems which have not provided an effective mechanism for establishing a trusted path include UNIX . . ." Johrie, col. I, II. 60-63.

The Commissioner also cannot now mend the Board's faulty conclusion of obviousness by substituting these alternative references for those relied upon by the Board. This new combination of references would constitute a new ground for rejection, not considered or relied upon by the Examiner or the Board. It is well settled that it would be inappropriate for us to consider such a new ground of rejection. *In re Margolis*, 785 F.2d 1029, 1032; 228 USPQ 940, 942 (Fed. Cir. 1986); *see also Koyo Seiko Co., Ltd. v. United States*, 95 F.3d 1094, 1099 (Fed. Cir. 1996) (holding that "[t]he grounds upon which an administrative order must be judged are those upon which the record discloses that its action was based.") (quoting *SEC v. Chenery Corp.*, 318 U.S. 80, 87 (1943)).

Finally, the deficiencies of the cited references cannot be remedied by the Board's general conclusions about what is "basic knowledge" or "common sense" to one of ordinary skill in the art. As described above, the Board contended that even if the cited UNIX and FILER2 references did not disclose a trusted path, "it is basic knowledge that communication in trusted environments is performed over trusted paths" and, moreover, verifying the trusted command in UNIX over a trusted path is "nothing more than good common sense." *Ex parte Zurko*, slip op. at 8. We cannot accept these findings by the Board. This assessment of basic knowledge and common sense was not based on any evidence in the record and, therefore, lacks substantial evidence support. As an administrative tribunal, the Board clearly has expertise in the subject matter over which it exercises jurisdiction. This expertise may provide sufficient

support for conclusions as to peripheral issues. With respect to core factual findings in a determination of patentability, however, the Board cannot simply reach conclusions based on its own understanding or experience -- or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings. [FN2] To hold otherwise would render the process of appellate review for substantial evidence on the record a meaningless exercise. *Baltimore & Ohio R.R. Co. v. Aderdeen & Rockfish R.R. Co.*, 393 U.S. 87, 91-92 (1968) (rejecting a determination of the Interstate Commerce Commission with no support in the record, noting that if the Court were to conclude otherwise "[t]he requirement for administrative decisions based on substantial evidence and reasoned findings -- which alone make effective judicial review *1698 possible -- would become lost in the haze of so-called expertise"). Accordingly, we cannot accept the Board's unsupported assessment of the prior art.

CONCLUSION

The Board's conclusion of obviousness was based on a misreading of the references relied upon and, therefore, lacks substantial evidence support.

Accordingly, the Board's judgment is reversed.

REVERSED.

FN1. Specifically, the Commissioner points to Johrie et al, U.S. Pat. No. 4,918,653; E.J. McCauley et al., *KSOS: The Design of a Secure Operating System*, Ford Aerospace and Communications Corp. (1979); Stanley R. Ames, Jr. et al., *Security Kernel Design and Implementation: An Introduction*, IEEE Cat. No. 830700-001 (July 1983); and Simon Wiseman et al., *The Trusted Path Between Smite and the User*, Proceedings 1988 IEEE Symposium on Security and Privacy (April 18-21, 1988).

FN2. As described above, we cannot accept the Commissioner's invitation to now search the record for references in support of the Board's general conclusions concerning the prior art. Even if any such references could support these conclusions, it would be inappropriate for us to consider references not relied upon by the Board. *In re Margolis*, 785 F.2d at 1032; 228 USPQ at 942.

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Appendix 5:

Crown Operations Intl. v. Solutia, Inc., 289 F.3d 1367, 62 U.S.P.Q.2d 1917 (Fed. Cir. 2002)

H

Crown Operations International Ltd.

v.
Solutia Inc.

U.S. Court of Appeals Federal Circuit

No. 01-1144

Decided May 13, 2002

PATENTS

[1] Patentability/Validity -- Anticipation -- Prior art (§ 115.0703)

Patentability/Validity -- Obviousness -- Relevant prior art -- In general (§ 115.0903.01)

Patent directed to solar and safety control glass with minimal visual distortion is not anticipated by prior art patent, since invention addresses visual distortion problem by limiting visible reflectance contribution of solar control film layer to no more than about 2 percent, whereas prior patent does not discuss or disclose 2 percent limitation, since prior reference will not be assumed to inherently contain claimed property merely because it discloses same structure, and since declaratory plaintiff has not presented sufficient evidence to rebut presumption of validity and defendant's facial evidence that prior patent does not disclose 2 percent limitation; patent is not obvious in light of prior art, since plaintiff has not shown that prior art contains teaching, suggestion, or motivation to reduce reflectance contribution to about 2 percent.

[2] Patentability/Validity -- Specification -- Enablement (§ 115.1105)

Genuine issue of fact exists as to whether patent in suit, directed to elimination of optical distortion in solar and safety control glass, is invalid for lack of enablement, since patent teaches measurement of texture of solar film layer in glass by calculating "wave index" using average amplitude and average pitch, but amplitude is not defined in patent, since person of ordinary skill in art would recognize several ways to measure amplitude, since amplitude directly impacts wave index calculation, and varying amplitude measurements produces range of wave index results, since novel aspects of invention must not be left to inference, since patent does not specify boundaries for average pitch and amplitude used to calculate wave index, leaving open possibility of range of embodiments that meet limitation but are inoperative, and since patent's rules for determining which wave peaks and valleys are small enough to be eliminated from index calculation are ambiguous.

PATENTS

Particular patents -- General and mechanical -- Safety and solar film for glass

4,973,511, Farmer, Ho, Riek, and Woodard, composite solar/safety film and laminated window assembly made therefrom, summary judgment that patent is not invalid affirmed.

5,091,258, Moran, laminate for a safety glazing, summary judgment that patent is not invalid for lack of enablement reversed.

***1918** Appeal from the U.S. District Court for the Western District of Wisconsin, Shabaz, S.J.

Action by Crown Operations International Ltd. and Marshall H. Krone against Solutia Inc. for declaratory judgment that defendant's patents are invalid. Plaintiffs appeal from grant of summary judgment in favor of defendant. Affirmed as to patent no. 4,973,511; reversed and remanded as to patent no. 5,091,258.

Joseph T. Leone and Joseph A. Ranney, of DeWitt, Ross, and Stevens, Madison, Wis., for plaintiffs-appellants.

Gregory E. Upchurch, Kenneth R. Heineman, and Dudley W. Von Holt, of Thompson Coburn, St. Louis, Mo., for defendant-appellee.

Before Lourie, Clevenger, and Gajarsa, circuit judges.

Gajarsa, J.

Crown Operations International, Ltd., and Mr. Marshall H. Krone (collectively "Crown"), appeal the decision of the United States District Court for the Western District of Wisconsin denying Crown declaratory relief that Solutia's U.S. Patent No. 4,973,511 ("the '511 patent") is invalid for lack of novelty and non-obviousness, and that Solutia's U.S. Patent No. 5,091,258 ("the '258 patent") is invalid for lack of enablement and written description. *Crown Operations Int'l, Ltd. v. Solutia, Inc.*, No. 99-C-802-S, slip op. at 8 (W.D. Wis. Aug. 30, 2000) (memorandum decision and order granting summary judgment) ("August 30 Order"); *Crown Operations Int'l, Ltd. v. Solutia, Inc.*, No. 99-C-802-S, slip op. at 24, 27 (W.D. Wis. Aug. 22, 2000) (same) ("August 22 Order"). Because we find no error in the district court's opinion with respect to the '511 patent, we affirm that portion

of the district court's decision. However, because the district court erred in its analysis of enablement for the '258 patent, and did not address the written description issue for the '258 patent, we reverse the district court's grant of summary judgment on that issue and remand for additional proceedings consistent with this opinion.

I. BACKGROUND

The patents at issue in this appeal relate to layered films used to create safety and solar control glass. An example is an automobile windshield. Most windshields have two layers of glass with a multi-layer film between the glass layers. The multi-layer film adds properties to the glass assembly, such as impact resistance or providing a conductive layer that facilitates defrosting the windshield. An inner layer of the film has solar control properties to selectively reflect, absorb (and thus convert to heat) or transmit defined percentages of certain wavelengths of light. This inner layer is called the solar control film. It is made of a substrate coated by one or more layers of metal or metallic substances. '511 patent, col. 3, l. 64 to col. 4, l. 2. Typically, manufacturers laminate the solar control film between layers of plasticized polyvinyl butyral ("PVB") (sometimes called the "safety film") in a process known as encapsulation. Then, the encapsulated solar control film is sandwiched between two pieces of glass for a final assembly of multi-layer glass with safety and solar control properties.

A. The '511 Patent

The '511 patent is directed to the problem that the metal-coated substrate, *i.e.*, solar control film, tends to wrinkle during encapsulation causing visual distortions. The '511 patent claims to mask the wrinkles from detection by the human eye by limiting to two percent or less the visible light reflection contribution of the solar control film compared to reflection from a complete assembly of glass, PVB and solar control film. '511 patent, col. 4, ll. 46-49, col. 8, l. 66 to col. 9, l. 6, col. 14, l. 67 to col. 15, l. 2. Figure 1 from the '511 patent, set forth below, shows the layers in a complete assembly.

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The complete safety and solar control glass assembly 10 includes two outer glass layers 28 & 30, PVB layers 22 & 23, and the solar control film 20. The solar control film is comprised of a substrate layer 16 and

solar control coating 18. '511 patent, col. 3, ll. 41-53, col. 7, ll. 2-4, col. 10, l. 15. Figure 3 from the '511 *1919 patent, set forth below, shows the sub-layers of the solar control coating 18.

TABULAR OR GRAPHIC MATERIAL SET AT THIS POINT IS NOT DISPLAYABLE

Layer 18 is made of multiple sub-layers. Layers 34 and 36 are metal oxide, and layer 38 is metal. '511 patent, col. 5, ll. 12-14. In addition, the '511 patent notes that "[p]rior automotive windshields have visible light reflection contributions for their solar films of three percent or greater." Further, it relates that the primary method of achieving a low solar control film reflectance contribution is by providing a specially-designed solar coating. '511 patent, col. 4, ll. 56-65.

On December 16, 1999, Crown sued Solutia (the "Initial Complaint"), seeking, among various other relief, a declaration that the '511 patent was invalid for anticipation and obviousness. Upon the parties' cross-motions for summary judgment, the district court found the '511 patent not anticipated and not invalid for obviousness. *August 22 Order* at 24, 27. We discuss herein only those portions of the *August 22 Order* relevant to the issues on appeal, which relate solely to the summary judgment finding that the '511 patent was not invalid on the grounds of anticipation and obviousness.

Claim 1, the only independent claim of the '511 patent, is set forth below, with the element numbers from Figure 1 inserted into the claim.

1. A composite solar/safety film [24] for use in a laminated window assembly [10] comprising:

a flexible, transparent plastic substrate layer [16] having a carrier surface and an opposing back surface;

a multilayer solar control coating [18] on said carrier surface, said coated substrate defining a solar control film [20]; and

at least one flexible, transparent, energy absorbing plastic safety layer [23 and/or 22] bonded to a surface of said solar control film;

wherein said solar control film contributes no more than about 2% visible reflectance, based on total visible incident radiation, in a laminated window assembly containing said composite solar/safety film laminated to at least one rigid transparent member [30]

and/or 28].

'511 patent, col. 14, l. 57 to col. 15, l. 4 (emphasis added and emphasized numbers added to identify elements shown in Figure 1 above).

Crown argued that U.S. Patent No. 4,017,661 to Gillery (the "Gillery patent") anticipates the '511 patent. The district court held otherwise, because, while the Gillery patent discloses the first three limitations of claim 1 of the '511 patent, it does not disclose the two percent visible reflectance limitation. The court found that neither the Gillery patent claims nor its description expressly disclose a two percent limit on reflectance contribution from the solar control film layer. Crown argued that the two percent limitation was inherently present in the Gillery patent's teachings because the Gillery patent disclosed an assembly with PVB layers, substrate layer, and substrate metal-coating--arguably of the same composition and thickness of the films disclosed by the '511 patent. Thus, Crown argued, because the structure, thickness and materials of the assembly were the same or within the same range(s), the Gillery patent must inherently disclose a two percent limitation. The district court rejected this argument because it found that none of the embodiments disclosed by the Gillery patent meet the two percent visible light reflectance limit. [FN1]

In its *August 22 Order*, the district court also held that the '511 patent was not rendered invalid for obviousness by Gillery or the other prior art cited by Crown because no prior art discloses: (i) that reflectance below two percent will mask wrinkles; (ii) a solar control film layer with reflectance below two percent; or (iii) any suggestion, motivation or teaching to reduce solar control film visible light reflectivity below two percent. Although the prior art generally sought to reduce visible light reflectivity, it also taught disadvantages of a very thin metal-coating on the substrate, including sacrificing infrared reflectivity. Thus, it taught that the proper compromise to *1920 achieve the conflicting goals of infrared (non-visible light) reflectance, visible light transmission and conductivity was a solar control film with a visible light reflectivity greater than two percent.

B. The '258 Patent

The '258 patent is directed at eliminating optical distortion, called "applesauce," in safety and solar control glass assemblies of the type discussed above for the '511 patent. The '258 patent discloses a method

to control distortion otherwise caused by the safety and solar film layer by measuring and controlling the texture of the surface of the PVB layers. The method expresses texture using a "wave index" and a "roughness value." The wave index calculation is at issue in this appeal. Wave index indicates the relative waviness of the surface of the PVB. Determining wave index involves measuring the surface of the PVB and then aggregating the measurements into a single number, the wave index, through a calculation purportedly described in the '258 patent.

The '258 patent directs one to use an instrument to physically measure the waviness of the surface of the PVB and capture the measurement into an electronic "trace line" representing the contours of the PVB surface. '258 patent, col. 7, ll. 54-65. Since the "trace line" is stored electronically, a computer program is used to calculate wave index from the trace. Three figures from the '258 patent, given below, provide examples of PVB surface trace lines.

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The rules for calculating the wave index implement a "smoothing" function. The smoothing process seeks to eliminate minor inflection points (peaks or valleys) to simplify the calculation of wave index. '258 patent, col. 7, l. 66 to col. 8, l. 2.

In the Initial Complaint, Crown sought a declaration that the '258 patent was invalid for anticipation and obviousness. Then, on May 26, 2000, Crown amended the complaint (the "Amended Complaint") to additionally claim in Count VI that the '258 patent is invalid under 35 U.S.C. § 112, first paragraph, because it lacked enablement and written description due to ambiguities in the disclosed wave index calculation. In its *August 22 Order*, the district court found the '258 patent not anticipated and not invalid for obviousness. *August 22 Order* at 28-29.

With respect to Count VI of Crown's amended complaint, Solutia moved for summary judgment on Crown's enablement and written description claim. Crown opposed Solutia's summary judgment motion, arguing that the '258 patent did not meet the enablement and written description requirements. The district court found the '258 patent not invalid for lack of enablement, but did not discuss in its opinion the written description requirement. *August 30 Order* at 8-13. We discuss herein only those portions of the *August 30 Order* relevant to the issues on appeal,

which relate to summary judgment finding the '258 patent not invalid on the grounds of enablement and the procedural disposition of the written description issue.

Claim 1 of the '258 patent is set forth below. In the language of this claim, "laminate" refers to the complete glass, PVB and solar control film assembly, and "functional performance layer" refers to the solar control coating. '258 patent, col. 3, ll. 45-65.

1. A laminate which is substantially free of reflected distortion when used in a safety glazing comprising:

a transparent, thermoplastic substrate layer, optionally surface treated or coated, bearing one or more functional performance layers; and

at least one layer of plasticized polyvinyl butyral bonded on one side to a functional performance layer or the substrate layer and having a roughened deairing surface on its other side characterized by a roughness value, Rz, of at least 10 micrometers;

said at least one plasticized polyvinyl butyral [PVB] layer, before bonding to the substrate layer or functional performance layer, possessing low surface waviness on each side characterized by a wave index *1921 value, WI, of less than 15,000 square micrometers.

'258 patent, col. 12, ll. 2-16 (emphasis added).

Crown argued that the rules disclosed by the '258 patent for calculating wave index are not sufficiently precise to enable a person of ordinary skill in the art to practice the '258 patent without undue experimentation. The wave index calculation as described by the '258 patent is set forth below.

In this regard, considering the waviness profile as a series of peaks and valleys, the smoothing rules of the program consider an inflection point to be a true peak or valley if it is: i) at least 100 micrometers away from the immediately preceding prior peak or valley and ii) at least 0.5 micrometer above or below the immediately preceding prior peak or valley, a valley being at least 0.5 micrometer below the immediately preceding prior peak. Pitch (P) is the distance between one valley and the next valley or in other words across the base of a peak. Average amplitude (H avg) and average pitch (P avg) are determined by the program for the smoothed trace of ten 12.5 mm tracing lengths (the second five lengths being 90° to the first five

lengths). From the average of the averaged H's and P's, a WI value is computed from the equation: Wave Index (WI) = (H avg) x (P avg) where H avg and P avg are in microns.

'258 patent, col. 8, ll. 3-19.

Crown asserted that according to the disclosed wave index "calculation," one of ordinary skill in the pertinent art would not know whether to instruct the smoothing program to disregard a peak by comparing it to an immediately preceding peak, or to a valley. The district court held that common sense and the clarifying clause "a valley being at least 0.5 micrometer below the immediately preceding prior peak" defeated Crown's argument. Thus, the district court held that the alleged grammatical ambiguities in the rules disclosed for calculating wave index did not invalidate the patent for lack of enablement.

Crown timely appealed the district court's two orders, raising the issues of anticipation and obviousness of the '511 patent, and lack of enablement and written description of the '258 patent. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

II. STANDARD OF REVIEW

We review a district court's grant of summary judgment without deference. *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1378, 53 USPQ2d 1225, 1227 (Fed. Cir. 1999). Summary judgment is appropriate when the moving party demonstrates that "there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law." Fed. R. Civ. P. 56(c); *Celotex Corp. v. Catrett*, 477 U.S. 317, 322-23 (1986). On summary judgment, the evidence must be viewed in the light most favorable to the party opposing the motion, *Poller v. Columbia Broad. Sys., Inc.*, 368 U.S. 464, 473 (1962), with doubts resolved in favor of the nonmovant, *Cantor v. Detroit Edison Co.*, 428 U.S. 579, 582 (1976); *Transmatic, Inc. v. Gulton Indus., Inc.*, 53 F.3d 1270, 1274, 35 USPQ2d 1035, 1038 (Fed. Cir. 1995). Once the moving party has satisfied its initial burden, the opposing party must establish a genuine issue of material fact and cannot rest on mere allegations, but must present actual evidence. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). Issues of fact are genuine only "if the evidence is such that a reasonable jury could return a verdict for the nonmoving party." *Id.* A disputed fact is material if it might affect the outcome of the suit such that a finding of that fact is necessary and relevant to the

proceeding. *Id.*; *General Mills, Inc. v. Hunt-Wesson, Inc.*, 103 F.3d 978, 980, 41 USPQ2d 1440, 1442 (Fed. Cir. 1997).

A patent is invalid for anticipation when the same device or method, having all of the elements contained in the claim limitations, is described in a single prior art reference. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 894, 221 USPQ 669, 673 (Fed. Cir. 1984). An anticipating reference must describe the patented subject matter with sufficient clarity and detail to establish that the subject matter existed in the prior art and that such existence would be recognized by persons of ordinary skill in the field of the invention. *See In re Spada*, 911 F.2d 705, 708, 15 USPQ 1655, 1657 (Fed. Cir. 1990); *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 678, 7 USPQ2d 1315, 1317 (Fed. Cir. 1988).

Obviousness is a legal conclusion based on underlying facts of four general types, all of *1922 which must be considered by the trier of fact: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) any objective indicia of nonobviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 17-18 [148 USPQ 459] (1966); *Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1270, 20 USPQ2d 1746, 1750-51 (Fed. Cir. 1991); *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1566-68, 1 USPQ2d 1593, 1594 (Fed. Cir. 1987).

"Determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention." *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 546, 48 USPQ2d 1321, 1329 (Fed. Cir. 1998). There must be a teaching or suggestion within the prior art, within the nature of the problem to be solved, or within the general knowledge of a person of ordinary skill in the field of the invention, to look to particular sources, to select particular elements, and to combine them as combined by the inventor. *See Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 665, 57 USPQ2d 1161, 1167 (Fed. Cir. 2000); *ATD Corp.*, 159 F.3d at 546, 48 USPQ2d at 1329; *Heidelberger Druckmaschinen AG v. Hantscho Commercial Prods., Inc.*, 21 F.3d 1068, 1072, 30 USPQ2d 1377, 1379 (Fed. Cir. 1994) ("When the patented invention is made by combining known components to achieve a new system, the prior art must provide a suggestion or

motivation to make such a combination.").

The written description inquiry is a factual one and must be assessed on a case-by-case basis. *See Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1561, 19 USPQ2d 1111, 1116 (Fed. Cir. 1991) (quoting *In re Smith*, 458 F.2d 1389, 1395, 173 USPQ 679, 683 (CCPA 1972) ("Precisely how close the original description must come to comply with the description requirement of § 112 must be determined on a case-by-case basis.")). In order to satisfy the written description requirement, the disclosure as originally filed does not have to provide in *haec verba* support for the claimed subject matter at issue. *See Fujikawa v. Wattanasin*, 93 F.3d 1559, 1570, 39 USPQ2d 1895, 1904 (Fed. Cir. 1996). Nonetheless, the disclosure must convey with reasonable clarity to those skilled in the art that the inventor was in possession of the invention, *Vas-Cath Inc.*, 935 F.2d at 1563-64, 19 USPQ2d at 1116-17, although we have also clarified that the possession test alone is not always sufficient to meet the written description requirement, *Enzo Biochem, Inc. v. Gen-Probe Inc.*, No. 01-1230, 2002 WL 487156, at *7 (Fed. Cir. Apr. 2, 2002). As such, "the written description requirement is satisfied by the patentee's disclosure of 'such descriptive means as words, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention.'" *Enzo Biochem*, 2002 WL at *7 (quoting *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997)). Put another way, one skilled in the art, reading the original disclosure, must reasonably discern the limitation at issue in the claims. *Waldemar Link GmbH & Co. v. Osteonics Corp.*, 32 F.3d 556, 558, 31 USPQ2d 1855, 1857 (Fed. Cir. 1994).

Whether a claim is enabled under 35 U.S.C. § 112, first paragraph is a question of law, although based upon underlying factual findings. *See PPG Indus., Inc. v. Guardian Indus. Corp.*, 75 F.3d 1558, 1564, 37 USPQ2d 1618, 1623 (Fed. Cir. 1996); *In re Goodman*, 11 F.3d 1046, 1049-50, 29 USPQ2d 2010, 2013 (Fed. Cir. 1993).

III. DISCUSSION

A. The '511 Patent

On appeal, Crown describes various purported errors in the district court's analysis of the validity of the '511 patent. Despite Crown's contentions, we ascertain no error requiring reversal of the district court's determination of validity over Crown's claims of anticipation and obviousness.

] Regarding alleged anticipation by the Gillary patent, on its face the Gillary patent does not disclose or discuss a two percent limitation for the reflectance contribution of the solar control film. Crown maintains that the '511 patent merely claims a preexisting property inherent in the structure disclosed in the prior art. Crown urges us to accept the proposition that if a prior art reference discloses the same structure as claimed by a patent, the resulting property, in this case, two percent solar control film reflectance, should be assumed. We decline to adopt this approach because this proposition is not in accordance with our cases on inherency. If the two percent reflectance limitation is inherently *1923 disclosed by the Gillary patent, [FN2] it must be necessarily present and a person of ordinary skill in the art would recognize its presence. *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999); *Continental Can*, 948 F.2d at 1268, 20 USPQ2d at 1749. Inherency "may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Id.* at 1269, 20 USPQ2d at 1749 (quoting *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981)).

In arguing inherent disclosure of the two percent limitation in the Gillary patent, Crown bears an evidentiary burden to establish that the limitation was necessarily present. [FN3] The moving party in a summary judgment motion has the burden to show "that there is an absence of evidence to support the non-moving party's case;" the non-moving party must affirmatively demonstrate by specific factual allegations that a genuine issue of material fact exists for trial. *Celotex Corp. v. Catrett*, 477 U.S. 317, 322-23 (1986). A patent enjoys a presumption of validity, *see* 35 U.S.C. § 282, which can be overcome only through clear and convincing evidence, *see* *United States Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1563, 41 USPQ2d 1225, 1232 (Fed. Cir. 1997). Given the presumption of validity afforded the '511 patent, Crown has failed to meet its burden because it has not presented sufficient evidence to rebut the facial evidence offered by Solutia that the Gillary patent does not disclose the two percent limitation. *See Eli Lilly & Co. v. Barr Lab. Inc.*, 251 F.3d 955, 962, 58 USPQ2d 1869, 1874 (Fed. Cir. 2001) ("[A] moving party seeking to have a patent held not invalid at summary judgment must show that the nonmoving party, who bears the burden of proof at trial, failed to produce clear and convincing evidence on an essential element of a defense upon which a reasonable jury could

invalidate the patent."); *In re Robertson*, 169 F.3d at 745 (recognizing that extrinsic evidence may be required to establish inherency). Instead, Crown offers only an assumption and its own contentions. [FN4]

Crown also argues that the district court erred by comparing reflectance values in the Gillary patent to non-corresponding values in the '511 patent. *August 22 Order* at 23-24. While perhaps the district court could have been more careful to explain the basis of its comparison, on a close reading of the district court's analysis we find that the alleged improper comparison only supported the district court's primary point - that no embodiment of the Gillary patent disclosed the two percent limitation, a conclusion that Crown has not shown to be in error.

Finally, Crown argues that various prior art references invalidate the '511 patent as obvious in view of such prior art. Crown's arguments lack merit because it has not shown that the prior art contains a teaching, suggestion or motivation to reduce the reflectance contribution of the solar control film to "no more than about two percent," and the district court properly concluded that there was no such teaching, suggestion or motivation in the prior art cited by Crown. *See Ruiz*, 234 F.3d at 665, 57 USPQ2d at 1167; *In re Rouffet*, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998).

B. The '258 Patent

On appeal, Crown argues that the district court erred in analyzing the impact of the ambiguities in the wave index calculation on the enablement requirement for the '258 patent. In *1924 addition to its enablement attack, Crown also argues that the '258 patent does not meet the written description requirement of § 112, first paragraph.

The two requirements, while related and springing from the same factual predicates, [FN5] each carry a separate purpose. The purpose of the enablement requirement is to "ensure[] that the public knowledge is enriched by the patent specification to a degree at least commensurate with the scope of the claims." *Nat'l Recovery Techs., Inc. v. Magnetic Separation Sys.*, 166 F.3d 1190, 1196, 49 USPQ2d 1671, 1675 (Fed. Cir. 1999). One of our predecessor courts has held the enablement and written description requirements to be separate and distinct, and has held that a "specification may contain a disclosure that is sufficient to enable one skilled in the art to make and use the invention and yet fail to comply with the description of the invention

requirement." *In re Barker and Pehl*, 559 F.2d 588, 591, 194 USPQ 470, 472 (CCPA 1977). Subsequently, this court has held that the purpose of the written description is distinct from merely explaining how to make and use the invention. *See Enzo Biochem*, 2002 WL at *7-8; *Vas-Cath*, 935 F.2d at 1563-64, 19 USPQ2d at 1117. In light of the odd procedural setting of the written description issue in this appeal, our disposition of this appeal based on enablement, and given that the two requirements are distinct and each are necessary, we do not reach the written description issue except to note that it appears to remain available for adjudication or disposition by the district court on remand. [FN6]

Turning to the enablement issue, we agree with Crown that the ambiguities and lack of specified boundary conditions, and Crown's proffered evidence concerning the same, raise a genuine issue of material fact as to whether a person of ordinary skill in the pertinent art could make or use the invention of the '258 patent [FN7] without undue experimentation. *White Consol. Indus. v. Vega Servo-Control*, 713 F.2d 788, 791, 218 USPQ 961, 963-64 (Fed. Cir. 1983). The district court found otherwise. However, it appears not to have considered the statements of Crown's expert concerning the effect of unspecified boundary conditions on the calculation of wave index.

] Following the reasoning of the district court, Solutia argues that a person of ordinary skill in the pertinent art could overcome any ambiguities in the wave index calculation without undue experimentation by testing a limited number of possibilities for computing the wave index. In response, Crown offers statements of its expert that the '258 patent does not define amplitude and that a person of ordinary skill in the art would not know whether to measure amplitude: (i) from a centerline running horizontally through the "middle" of the trace; (ii) from "peak-to-peak," i.e., from the bottom of a valley to the top of a peak; or (iii) from some other baseline or reference running horizontally somewhere through the trace. On its face, the '258 patent does not define amplitude. However, average amplitude directly impacts the wave index calculation because wave index is the result of multiplying average amplitude by average pitch. Simply put, the wave index calculation would produce two separate numbers *1925 if calculated with a centerline versus a "peak-to-peak" amplitude. Worse yet, a range of various wave index values are possible for amplitude baselines running horizontally somewhere through the trace at various locations. To

show that the wave index calculation is enabled, Solutia cites various details from the '258 patent concerning how to perform the test to generate a trace of the PVB surface to calculate wave index. However, Solutia does not present sufficient evidence to rebut Crown's demonstration of the amplitude ambiguity in the wave index calculation. This is so because: (i) the amplitude is a direct input to the critical claim limitation, a wave index of less than 15,000 square micrometers; and (ii) the novel aspects of the invention must be disclosed and not left to inference, that is, a patentee may not rely on the inference of a person of ordinary skill in the pertinent art to supply such novel aspects. *See Genentech Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1366, 42 USPQ2d 1001, 1005 (Fed. Cir. 1997) (stating that the knowledge of a hypothetical person of ordinary skill in the art cannot be used to supply the patentable aspects of the invention).

Compounding the amplitude ambiguity, Crown also notes that the wave index is the result of two independently varying, unbounded terms: average pitch and average amplitude. On its face, this does not seem to be a problem. However, Crown's expert noted that because boundary conditions are not specified, the claim covers inoperative embodiments. For example, a wave index of 15,000 square micrometers results from an average height of 1000 micrometers multiplied by an average pitch of 15 micrometers. Yet, according to Crown's expert, an average height of 1000 micrometers would not be acceptable for the PVB. As with the amplitude ambiguity, the problem goes well beyond this single example because a full range of resulting inoperative embodiments are possible for values of average height and average pitch that, when multiplied, produce a wave index value that meets the limitation of the claim. Such inoperative embodiments do not necessarily invalidate the claim. *See Atlas Powder Co. v. E.I. du Pont de Nemours & Co.*, 750 F.2d 1569, 1576-77, 224 USPQ 409, 414 (Fed. Cir. 1984); *In re Cook*, 439 F.2d 730, 735, 169 USPQ 298, 302 (CCPA 1971) (noting that although claims may read on some inoperative embodiments, this does not necessarily invalidate the claim if the necessary information to limit the claims to operative embodiments is known to a person of ordinary skill in the art). [FN8] However, the inoperative embodiments support Crown's assertion that there is a genuine issue of material fact with respect to enablement. *See Atlas Powder*, 750 F.2d at 1576-77; *see also Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1358-59, 52 USPQ2d 1029, 1034-35 (Fed. Cir. 1999) (holding that the district court failed in its claim construction to

consider the effect of inoperative embodiments on invalidity due to lack of enablement). [FN9]

Further compounding the ambiguities with the wave index rules, the '258 patent's rules for determining which inflection points are "true" inflection points additionally support Crown's argument that it has raised a genuine issue of material fact. Crown demonstrated in various ways through its experts and arguments the potential indeterminacy in the rules. Solutia's expert admitted that there was some ambiguity in the rules with respect to whether a preceding peak or valley was the reference point in selecting a "true" peak or valley.

Solutia argues that even if the disclosed wave index calculation has ambiguities and is indeterminate, a person of ordinary skill in the pertinent art would be able to make and use the invention with some experimentation, but less than "undue" experimentation. Solutia argues that such a skilled person would only have to try two possibilities for amplitude, centerline and "peak- to-peak," and that experimenting to discover which of two possibilities to use is well within the boundary of undue experimentation. Crown counters that the amplitude ambiguity and potential inoperative embodiments, combined with the ambiguities in the smoothing rules, seems to suggest *1926 a wide range of possibilities which one must try. [FN10] With this wide range of possibilities, we agree that Crown has raised a genuine issue of material fact as to the amount and type of experimentation required, facts that will determine whether such experimentation is undue. *See Enzo Biochem Inc., v. Calgene Inc.*, 188 F.3d 1362, 1371, 52 USPQ2d 1129, 1135-36 (Fed. Cir. 1999) (holding that a reasonable amount of experimentation does not invalidate a patent, but undue experimentation does invalidate, and holding that the *Wands* factors, which determine whether a patent's disclosure is insufficient such that the experimentation required would be undue, apply to inter partes litigation). [FN11] While ultimately a trier of fact may reach the conclusion that any required experimentation is not undue, Crown has shown that sufficient potential for undue experimentation exists such that disposal on summary judgment is improper.

CONCLUSION

Because we hold that the '511 patent has not been shown to be invalid due to anticipation or obviousness and that a genuine issue of material fact exists with respect to facts underlying the determination of

enablement for the '258 patent, we affirm-in-part and reverse-in-part the district court's decision and remand for additional proceedings consistent with this opinion.

AFFIRMED-IN-PART, REVERSED-IN-PART, AND REMANDED.

COSTS

Each party bears its own costs.

FN1. The district court, applying a similar analysis, also found that UK Patent Application GB 2 057 355 (the "UK patent") did not anticipate the '511 patent because it did not have the two percent limitation.

FN2. In order to claim "equivalent structure" between the Gillary patent and the '511 patent, Crown's inherency argument rests on a precondition of its own making - that the Gillary patent discloses use of TiO₂, even though it specifies TiO_x, where x is greater than 1.0 but less than 2.0. Although Crown vigorously argues this point, we do not reach this issue because even if Crown is correct that the structures are equivalent, Crown's inherency argument fails for the reasons set forth herein.

FN3. Crown's reliance on *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 36 USPQ2d 1225 (Fed. Cir. 1995), and *O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 42 USPQ2d 1777 (Fed. Cir. 1997), to characterize the two percent limitation as a "performance limitation" similar to the claim terms at issue in those cases is unpersuasive and overbroad. Respectively, *Pall* and *Tekmar* dealt with the claim terms "skinless" and "passage." Beyond the readily apparent difference between these potentially broad terms and the precise specification of a two percent limit in the '511 patent, characterizing a claim limitation as a "performance characteristic" is not helpful as to whether the "necessarily present" requirement of inherency is met.

FN4. As indicated by this Court's questions at oral argument concerning the seemingly direct route to prove that the Gillary patent contains the two percent limitation--implementing an embodiment of the Gillary patent and testing it--this Court finds puzzling Crown's reluctance regarding this approach to generate extrinsic proof that the Gillary patent inherently meets the two percent limitation.

FN5. Also springing from these same underlying factual predicates is the § 112, second paragraph, definiteness requirement. This requirement is distinct from the enablement and description requirements, which arise from § 112, first paragraph.

[D]efiniteness and enablement are analytically

distinct requirements, even though both concepts are contained in 35 U.S.C. § 112. The definiteness requirement of 35 U.S.C. § 112, ¶ 2 is a legal requirement, based on the court's role as construer of patent claims . . . Definiteness requires the language of the claim to set forth clearly the domain over which the applicant seeks exclusive rights. . . . The test for whether a claim meets the definiteness requirement is "whether one skilled in the art would understand the bounds of the claim when read in light of the specification."

Process Control Corp., 190 F.3d at 1358 n.2, 52 USPQ2d at 1034 n.2 (internal citations omitted). *See also* 3 Donald S. Chisum, *Chisum on Patents*, § 8.03 at 8-14(2001) (noting the difference between the requirements of "definiteness, which claims must meet, from the requirements of enablement, which the disclosures of the specification must meet").

FN6. Based on the record before us, the written description issue has the following procedural posture: (i) Crown's Count VI of its amended complaint raised the written description issue; (ii) Solutia's summary judgment motion argued that the '258 patent met the written description requirement; (iii) in opposition Crown argued that the written description requirement was not met; (iv) the district court did not dispose of the written description issue or discuss the issue in its opinion in a way that enables our review; and (v) Crown preserved the written description issue in its appeal to this court and thus has not waived its further adjudication on remand.

FN7. All seventeen claims of the '258 patent refer to wave index, thus they all stand or fall together.

FN8. The court in *In re Cook* further notes that a claim may be invalid if it reads on significant numbers of inoperative embodiments. *In re Cook*, 439 F.2d at 734, 169 USPQ at 301-02 (citing *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 336 U.S. 271, 276-77, 80 USPQ 451, 453 (1949)). *See also In re Moore*, 439 F.2d 1232, 1236169 USPQ 236, 239 (CCPA 1971) (noting that the question is whether the scope of enablement conveyed by the disclosure to a person of ordinary skill in the art is commensurate

with the scope of protection taught by the claims); Chisum, § 7.03[7][a] at 7-108 & n.6.

FN9. The inoperative embodiment inquiry informs the enablement inquiry; they are not the same inquiry. *Nat'l Recovery Techs.*, 166 F.3d at 1196, 49 USPQ2d at 1676.

FN10. We note that the specification for the '258 patent states that in the disclosed embodiment the wave index is calculated using a software program running on a personal computer being fed the trace line. '258 patent, col. 7, ll. 64-68. Undoubtedly, Solutia took care to ensure that the program contained the necessary boundary conditions and other information to calculate wave index to practice the invention. It appears, however, that Solutia took substantially less care in transcribing the information from the program into the specification's rules for calculating wave index. This incongruity will be relevant to the question of enablement upon remand. *See Chisum*, § 7.03[4][e] at 7-86 & n.77 ("A specification that claims an invention requiring implementation through computer software but fails to set forth the details of computer programming may present issues of whether the experimentation required to write the programming is reasonable or unreasonable.") (summarizing the teachings of various cases).

FN11. The *Wands* factors are:

(1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

FN11. *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

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Appendix 6:

Ex parte Herbermann, 1997 WL 1935418 (Bd. Pat. App. & Interf. 1997)

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***1 THIS OPINION WAS NOT WRITTEN FOR PUBLICATION**

Board of Patent Appeals and Interferences

Patent and Trademark Office (P.T.O.)
EX PARTE ALFRED F. HERBERMANN
Appeal No. 97-2999
Application No. 08/338,714 [FN1]

NO DATE REFERENCE AVAILABLE FOR THIS DOCUMENT

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Before STAAB, McQUADE, and NASE
Administrative Patent Judges

NASE
Administrative Patent Judge

ON BRIEF

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 23 through 25, 33 and 35 through 40 [FN2] Claims 26 through 32 are allowed. Claims 1 through 22 and 34 have been canceled.

We AFFIRM-IN-PART.

BACKGROUND

The appellant's invention relates to ball jointed links. An understanding of the invention can be derived from a reading of exemplary claims 23, 33 and 36, which appear in the appendix to the appellant's brief.

The prior art references of record relied upon by the examiner as evidence of obviousness under 35 U.S.C. § 103 are:

Haver	2,329,369	Sep. 14, 1943
Kujawski	2,439,009	Apr. 6, 1948
Wagenknecht	4,941,481	July 17, 1990

Claims 33 and 35 through 40 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and

(Cite as: 1997 WL 1935418, *1 (Bd.Pat.App & Interf.))

distinctly claim the subject matter which the appellant regards as the invention.

Claims 23 through 25 stand rejected under 35 U.S.C. § 103 as being unpatentable over Kujawski in view of Haver.

Claims 33 and 35 through 40 stand rejected under 35 U.S.C. § 103 as being unpatentable over Kujawski in view of Wagenknecht.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellant regarding the § 103 and § 112 rejections, we make reference to the examiner's answer (Paper No. 22, mailed March 17, 1997) for the examiner's complete reasoning in support of the rejections, and to the appellant's brief (Paper No. 21, filed December 23, 1996) and reply brief (Paper No. 23, filed May 5, 1997) for the appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by the appellant and the examiner. As a consequence of our review, we make the determinations which follow.

The indefiniteness issues

We do not sustain the rejections of claims 33 and 35 through 40 under 35 U.S.C. § 112, second paragraph.

The second paragraph of 35 U.S.C. § 112 requires claims to set out and circumscribe a particular area with a reasonable degree of precision and particularity. *In re Johnson*, 558 F.2d 1008, 1015, 194 USPQ 187, 193 (CCPA 1977). In making this determination, the definiteness of the language employed in the claims must be analyzed, not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art. *Id.*

Claims 33 and 35

*2 We do not agree with the examiner that claim 33 infers that the male ball is formed of a material "harder" than the clamp. Claim 33 recites that the male ball is formed of a material that is "harder" than the female locking portion. The specification makes clear that the female locking portion includes both the socket 30 and the clamp 28. The specification also clearly describes that the male ball 32 is formed of a material that is "harder" than the socket 30. In our opinion, claim 33, when read in light of the specification, is definite since the scope of the invention sought to be patented can be determined from the language of the claim with a reasonable degree of certainty. Furthermore, while the examiner is correct that the language of claim 33 is broad enough to read on the male ball being formed of a material "harder" than the clamp, the mere breadth of the claim does not in and of itself make the claim indefinite.

Claims 36 through 40

(Cite as: 1997 WL 1935418, *2 (Bd.Pat.App & Interf.))

We do not agree with the examiner that claim 36 is indefinite. When considering claim 36 as a whole, it is clear to us that claim 36 is reciting the combination of a base, a mount structure, a tool and at least two links. We reach this conclusion based upon claim 36 reciting (1) "A structure . . . comprising: a mount structure mounted to a base; a tool mounted at a location remote from said base," and (2) that the at least two links connect "said tool to said base." While we agree with the examiner, that the preamble of claim 36 is inconsistent with the recitations of the body of the claim, such inconsistency, in this case, does not render the claim indefinite since the scope of the invention sought to be patented can be determined from the language of the claim with a reasonable degree of certainty. [FN3]

The obviousness issues

Claims 23 through 25

We sustain the rejection of claims 23 through 25 under 35 U.S.C. § 103.

Claim 23 recites a link element comprising, *inter alia*, a male ball, a female socket, and a body extension extending between the male ball and the female socket. The male ball is locked on the body extension by the male ball having a recess which receives a bead provided on the body extension.

Kujawski discloses a flexible joint of the ball and socket type. As shown in Figures 1 and 2, Kujawski's flexible joint includes a conduit 10 having two ends, a socket housing 22 is connected to one end of the conduit 10 and a ball 20 is connected to the other end of the conduit 10. As shown in Figure 2, the conduit 10 appears to be threadably connected to the ball 20.

Haver discloses a ball and socket joint. As shown in Figure 1, the joint includes a spherical cuff (i.e., ball) 8, a tubular outlet 5, and a socket 10. An annular ridge 6 is formed in the tubular outlet 5 to engage with an annular slot 7 formed in the inner wall of the cuff 8 and serves to secure the cuff 8 firmly in position upon the end of the tubular outlet 5.

***3** After the scope and content of the prior art are determined, the differences between the prior art and the claims at issue are to be ascertained. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

Based on our analysis and review of Kujawski and claim 23, we agree with the examiner that the only difference is that Kujawski utilizes a thread to secure conduit 10 (i.e., the body extension) to the ball 20 whereas claim 23 requires a bead on the body extension cooperating with a recess in the male ball to lock the male ball on the body extension.

With regard to this difference, the examiner determined (answer, p. 6) that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the link assembly of Kujawski by substituting the mating thread locking arrangement with the deformed bead and corresponding groove locking arrangement to benefit from having the locking arrangement which is much more simple and cost effective to make.
We agree.

We do not agree with the appellant's argument (brief, pp. 9-10) that there is no suggestion in Haver that would have led one to modify Kujawski. When it is necessary to select elements of various teachings in order to form the claimed

(Cite as: 1997 WL 1935418, *3 (Bd.Pat.App & Interf.))

invention, we ascertain whether there is any suggestion or motivation in the prior art to make the selection made by the appellant. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. The extent to which such suggestion must be explicit in, or may be fairly inferred from, the references, is decided on the facts of each case, in light of the prior art and its relationship to the appellant's invention. Thus, the references themselves must provide some teaching whereby the appellant's combination would have been obvious. *In re Gorman*, 933 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991) (citations omitted). That is, something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. See *In re Beattie*, 974 F.2d 1309, 1312, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992); *Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984). In this case, it is our opinion that the teaching of Haver that ridge 6 is shaped to engage slot 7 to firmly secure the cuff 8 in position on the outlet 5 provides the needed suggestion to modify Kujawski as set forth by the examiner. Additionally, the self-evident advantages (e.g., a locking arrangement which is much more simple and cost effective to make) of substituting one known locking arrangement (i.e., bead and groove) for another known locking arrangement (i.e., threads) would have been readily apparent to a person of ordinary skill in the art. [FN4]

For the reasons set forth above, we sustain the examiner's rejection of claim 23 under 35 U.S.C. § 103.

*4 The appellant has grouped claims 23 through 25 as standing or falling together. [FN5] Thereby, in accordance with 37 CFR § 1.192(c)(7), claims 24 and 25 fall with claim 23. Thus, it follows that the examiner's rejection of claim 24 and 25 under 35 U.S.C. § 103 is also sustained.

Claims 33 and 35 through 40

We do not sustain the rejection of claims 33 and 35 through 40 under 35 U.S.C. § 103.

Independent claims 33 recites "a clamp tightened to have surfaces moving radially inwardly to lock said female locking portion on said male ball." Independent claims 36 recites "a clamp tightened to have surfaces moving radially inwardly to lock said female locking structure on said male ball."

With respect to the above-noted limitations, the examiner concluded (answer, p. 10) that due to the geometry of Kujawski's spherical ball 20, "the surface 30 would inherently move radially inward as the clamp 27 is screwed onto the threaded element 25."

The appellant (reply brief, pp. 2-3) does not agree with the examiner's "inherent" interpretation of movement. The appellant believes that as Kujawski's clamp 27 is screwed onto the threaded element 25, the surface 30 would be moved radially outwardly as the flange 29 moves onto larger diameter portions of the ball 20.

When relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. See *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Patent App. &

(Cite as: 1997 WL 1935418, *4 (Bd.Pat.App & Interf.))

Int. 1990). The mere fact that a certain thing may result from a given set of circumstances is not sufficient. See *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981). We are mindful that there is a line of cases represented by *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971) which indicates that where an examiner has reason to believe that a functional limitation asserted to be critical in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, the examiner possesses the authority to require an applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied on. Nevertheless, before an applicant can be put to this burdensome task, the examiner must provide sufficient evidence or scientific reasoning to establish the reasonableness of the examiner's belief that the functional limitation is an inherent characteristic of the prior art. In the case before us, it is our opinion that the examiner has not provided sufficient evidence or scientific reasoning to establish the reasonableness of his belief that the functional limitation is an inherent characteristic of Kujawski.

We have also reviewed the Haver and Wagenknecht references additionally relied upon by the examiner in rejecting the claims under appeal but find nothing therein that would have suggested the above-noted deficiency of Kujawski.

*5 Since all the limitations of independent claims 33 and 36 are not suggested or taught by the applied prior art, we cannot sustain the examiner's rejection of appealed claims 33 and 36, or claims 35 and 37 through 40 which depend therefrom, under 35 U.S.C. § 103.

CONCLUSION

To summarize, the decision of the examiner to reject claims 33 and 35 through 40 under 35 U.S.C. § 112, second paragraph is reversed; the decision of the examiner to reject claims 23 through 25 under 35 U.S.C. § 103 is affirmed; and the decision of the examiner to reject claims 33 and 35 through 40 under 35 U.S.C. § 103 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

 AFFIRMED-IN-PART

BOARD OF PATENT APPEALS AND INTERFERENCES

LAWRENCE J. STAAB
Administrative Patent Judge
JOHN P. MCQUADE
Administrative Patent Judge
JEFFREY V. NASE
Administrative Patent Judge

FN1. Application for patent filed November 14, 1994. According to the appellant, the application is a continuation of Application No. 08/177,091, filed January 3, 1994, now U.S. Patent No. 5,383,738, which was a continuation of Application No. 07/840,420, filed February 24, 1992, now abandoned.

(Cite as: 1997 WL 1935418, *5 (Bd.Pat.App & Interf.))

FN2. Claims 23, 33 and 35 have been amended subsequent to the final rejection.

FN3. We encourage the appellant to correct this inconsistency by filing a suitable amendment, such as the deletion of "for supporting a tool" from line 1 of claim 36.

FN4. An artisan must be presumed to know something about the art apart from what the references disclose (see *In re Jacoby*, 309 F.2d 513, 516, 135 USPQ 317, 319 (CCPA 1962)) and the conclusion of obviousness may be made from "common knowledge and common sense" of the person of ordinary skill in the art (see *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969)).

FN5. See page 4 of the appellant's brief.

APPEAL NO. 97-2999 - JUDGE NASE

APPLICATION NO. 08/338,714

APJ NASE

APJ STAAB

APJ McQUADE

DECISION: AFFIRMED-IN-PART

Prepared By: Delores A. Lowe

DRAFT TYPED: 11 Mar 98

FINAL TYPED:

1997 WL 1935418 (Bd.Pat.App & Interf.)

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Appendix 7:

In re Oelrich, 666 F.2d 578, 212 U.S.P.Q. 323 (C.C.P.A. 1981)

In re Oelrich and Divigard

Court of Customs and Patent Appeals

No. 81-564

Decided Dec. 10, 1981

United States Patents Quarterly Headnotes

PATENTS

[1] Court of Customs and Patent Appeals -- Issues determined -- Ex parte patent cases (§ 28.203)
Prior adjudication -- Applications for patent (§ 56.05)

Doctrine of res judicata argued in view of former case in which issue was obviousness is not applicable to instant anticipation rejection; furthermore, res judicata does not have its usual impact when considering ex parte patent appeals; public interest in granting valid patents outweighs public interest underlying collateral estoppel and res judicata, particularly where issue presented is not substantially identical to that previously decided.

PATENTS

[2] Patentability -- New use or function -- In general (§ 51.551)

Mere recitation of newly discovered function or property, inherently possessed by things in prior art, does not distinguish claim drawn to those things from prior art.

PATENTS

[3] Construction of specification and claims -- "Means" claims (§ 22.60)

Pleading and practice in Patent Office -- Rejections (§ 54.7)

Rejection of claim whose distinguishing feature is words after means for function phrase is reversed where those words constitute limiting definition of means that is not expressly disclosed in reference nor inherent in it.

PATENTS

Particular patents -- Control Mechanism

Oelrich and Divigard, Sub-Critical Time Modulated Control Mechanism, rejection of claim 1 reversed.

*324 Appeal from Patent and Trademark Office Board of Appeals.

Application for patent of John A. Oelrich and Albert

J. Divigard, Serial No. 452,050, filed Mar. 18, 1974. From decision rejecting claim 1, applicants appeal. Reversed.

See also 198 USPQ 210.

Roger A. Van Kirk, East Hartford, Conn., for appellants.

Joseph F. Nakamura and Thomas E. Lynch for Patent and Trademark Office.

Before Markey, Chief Judge, and Rich, Baldwin, Miller, and Nies, Associate Judges.

Rich, Judge.

This appeal is from the decision of the United States Patent and Trademark Office (PTO) Board of Appeals (board) sustaining the examiner's rejection of claim 1 in application serial No. 452,050, filed March 18, 1974, entitled "Sub-Critical Time Modulated Control Mechanism," under 35 USC 102 as anticipated by appellant Oelrich's U.S. patent No. 3,430,536 for "Time Modulated Pneumatically Actuated Control Mechanism," issued March 4, 1969. We reverse.

Background

This application was the subject of *In re Oelrich*, 579 F.2d 86, 198 USPQ 210 (CCPA 1978), in which a rejection of claims 1-5 under 35 USC 103 was reversed. Appellant's method claims 2-5 now stand allowed.

The invention of claim 1 is directed to an apparatus specially adapted for moving low inertia steering fins on guided missiles. The prior art apparatus and the theory upon which it operates are fully discussed in our above prior opinion and will, therefore, not be repeated here. Generally, the claimed device responds to an electric signal from a missile guidance system, the magnitude of which is proportional to the desired amount of course-correcting fin movement, and converts the signal into a pneumatic pressure of appropriate magnitude which acts on a piston to move the missile guiding fin. The device which is the subject of the Oelrich patent "was employed only with the then available steering fins which they characterize as 'high inertia' loads." [FN1] The frequency at which this "high inertia" load system is operated is stated to be *above* the critical (resonant) frequency of the system. 579 F.2d at 87-89, 198 USPQ at 212-13. The allowed

method claims and apparatus claim 1 direct use of a carrier frequency *below* the critical frequency of the system.

Claim 1 reads (emphasis ours):

1. A time modulated fluid actuated control apparatus comprising:

housing means, said housing means defining a cylinder;

actuator piston means disposed in said housing means cylinder, said piston means including an output member adapted to be connected to a movable load, said load and control apparatus *325 defining a *system having a range of resonant frequencies*;

solenoid operated valve means mounted on said housing means, said valve means being selectively operable to deliver pressurized fluid to and to vent fluid from said housing means cylinder at one side of said piston means;

means for generating variable input command signals commensurate with the desired position of the load, said command signals being characterized by a dynamic frequency range *below said range of said resonant frequencies*;

means for generating a signal at a *carrier frequency*, said carrier frequency being *greater than the maximum dynamic command signal frequency and less than the minimum system resonant frequency*;

means for modulating said carrier frequency signal by said command signals; and

means responsive to said modulated carrier frequency signal for controlling energization of said solenoid operated valve means.

In sustaining the examiner's rejection under §102, the board expressed agreement with his reasoning, which is here summarized. Stating that "the issue is identical to that decided in *In re Ludtke*, 58 CCPA 1159, 441 F.2d 660, 169 USPQ 563 (1971)," the examiner noted that, for purposes of determining inherency, "the question is, does Oelrich [the reference patent] disclose a signal generator that necessarily must supply the carrier frequencies that appellants use?" The examiner turned to Exhibit A of coapplicant Divigard's affidavit,

which states as an assumption in a "Linearized Simulation" of a "high inertia" load system that the critical resonance frequency must be kept below 80 Hz to avoid interaction with the carrier frequency which is between 100 and 150 Hz. Thus, the examiner concluded, "Exhibit A establishes Oelrich's carrier frequency range, which may now be compared with the carrier frequency range of applicants' low-inertia system." It was then asserted that the Oelrich and Kolk affidavits establish that good low inertia system design practice dictates a carrier frequency range of 95-190 Hz. Since the carrier frequency range for the high inertia system lies within the range for the low inertia system, and since the critical frequency of the low inertia system is near the solenoid limit of 175 Hz, the examiner posited that the Oelrich carrier frequencies would be sub-critical in the low inertia system, saying, "Thus Oelrich's signal generator does in fact inherently produce frequencies which would be sub-critical when used with a low-inertia system, and therefore, inherently supplies a carrier frequency range which is usable in applicants' system since this conclusion was deduced from specific data presented in the patent and in the affidavits supplied by appellants." The appellants also asserted our prior decision was *res judicata*.

Opinion

[1] Although appellants' arguments on appeal are directed primarily to a discussion of *res judicata* [FN2] and whether a "product which is unwittingly produced is anticipation," resolution of this case is properly had by comparison of the reference patent to the limitations of claim 1. As will appear, the determinative issue is a question of inherency.

The distinguishing feature of claim 1 is defined in the paragraph which states that the apparatus contains a

means for generating a * * * carrier frequency * * * greater than the maximum dynamic command signal frequency and *less than* the minimum system resonant frequency. [FN3]

Given that the carrier frequency which can be used in a low inertia system *may* fall within the range of carrier frequencies usable in a high inertia system (appellants admit as much), the PTO urges that the apparatus of the Oelrich patent inherently performs the function of the apparatus of claim 1, and that finding a new use for an old device does not entitle one to an apparatus claim for that device, citing *In re Wiseman*, 596 F.2d 1019, 201 USPQ 658 (CCPA 1979). Appellants in that case argued, however, that a structure suggested by the

*326 prior art was patentable to them because it also possessed an *inherent but unknown* function which they claimed to have discovered. This court stated that a "patent on such a structure would remove from the public that which is in the public domain by virtue of its inclusion in, or obviousness from, the prior art." Id. at 1023, 201 USPQ at 661.

Appellants here countered the PTO inherency contention at oral argument (no reply brief was filed) by urging that there is no "inherency" because there is no "inevitability," that is, the previously quoted "means plus function" limitation of claim 1 is not inherently (always) present in the device of the Oelrich patent.

[2] It is true that mere recitation of a newly discovered function or property, inherently possessed by things in the prior art, does not distinguish a claim drawn to those things from the prior art. In re Swinehart, 58 CCPA 1027, 1031, 439 F.2d 210, 212-13, 169 USPQ 226, 229 (1971). In this case, however, claim 1 does not merely recite a newly discovered function of an old device. In re Chandler, 45 CCPA 911, 254 F.2d 396, 117 USPQ 361 (1958), a case not cited by either party to this appeal, is most pertinent to the instant controversy.

The claim in Chandler, id. at 912-13, 254 F.2d at 397, 117 USPQ at 361-62, drawn to an automatic control for a jet engine, included a "means responsive to said movement for regulating the propulsive power of said engine, in accordance with said movement, *so that* said aircraft is propelled at a definite, selected speed, corresponding to the position of said engine relative to said aircraft, throughout the speed range of said aircraft." (Emphasis added.) In refuting the examiner's argument that the words beginning with "so that" were merely functional, and thus did not distinguish the device from that claimed in a patent to Goddard, this court stated:

* * * the expression beginning with "so that" is not merely functional, but constitutes a part of the definition of the "means responsive to said movement." Thus that means is defined as being responsive to the movement of the engine in such a way that the aircraft will be propelled at a definite speed in the manner specified. Such a definition conforms to the provision of 35 U.S.C. 112 that an element in a claim for a combination "may be expressed as a means or step for performing a specified function without the recital of structure, material or acts in support thereof. [FN4]

[3] Likewise, the words after "means for generating a * * * carrier frequency" in the claim on appeal constitute a limiting definition of the means. The PTO does not contend that this limitation, a carrier frequency which is "less than the minimum system resonant frequency," is expressly disclosed in the Oelrich patent. Neither, however, is this limitation inherent therein. In Hansgirg v. Kemmer, 26 CCPA 937, 940, 102 F.2d 212, 214, 40 USPQ 665, 667 (1939), the court said:

Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient. [Citations omitted.] If, however, the disclosure is sufficient to show that the natural result flowing from the operation as taught would result in the performance of the questioned function, it seems to be well settled that the disclosure should be regarded as sufficient.

The relationship between the carrier frequency and the system critical frequency -- the former below the latter (and expressly made a claim limitation by use of "means plus function" language) -- cannot be said to be "the natural result flowing from the operation as taught." The Oelrich patent instructs that the device is "adapted to receive a carrier frequency substantially in excess of the particular system critical or resonant frequency* * *." Given this express teaching, a "means for generating a* * * carrier frequency* * *less than the minimum system resonant frequency" is not inevitably present.

The decision of the board is *reversed*.

Reversed.

FN1 While the solicitor equates "low-inertia" with a "relatively light load" and "high-inertia" with a "relatively heavy load," appellants are not as unequivocal. They refer to "small inertia" and "low inertia" loads, but, for example, the Divigard affidavit refers to "Fin Inertia" in terms of "in-lb sec super2 / rad," a unit of measure applicable only in referencing *moment of inertia*, not *inertia*. The difference is significant because inertia, measured in terms of *mass*, is closely related to *weight*, while moment of inertia is affected by the *distribution* of the mass. Because of this ambiguity, we cannot and do not use the terms "weight" and "inertia" interchangeably.

FN2 The doctrine of res judicata, argued in view of our decision in In re Oelrich, 579 F.2d 86, 198 USPQ 210 (CCPA 1978), is not applicable to the instant

rejection. The issue in the former case was obviousness; here it is anticipation. A new rejection is before us. Furthermore, res judicata does not have its usual impact when considering ex parte patent appeals; the public interest in granting valid patents outweighs the public interest underlying collateral estoppel and res judicata, particularly where the issue presented is not substantially identical to that previously decided. *In re Russell*, 58 CCPA 1081, 1083, 439 F.2d 1228, 1230, 169 USPQ 426, 428 (1971); *In re Craig*, 56 CCPA 1438, 1441-42, 411 F.2d 1333, 1335-36, 162 USPQ 157, 159 (1969).

FN3 Emphasis is ours. Portions of the claim unnecessary to this discussion have been omitted for

clarity.

FN4 For a similar case, see *In re Wilson*, 53 CCPA 1141, 1148-49, 359 F.2d 456, 461, 149 USPQ 523, 527 (1966). The provision of §112 referred to is, of course, the sixth paragraph, formerly, at the times of Chandler and Wilson, the third paragraph. The change occurred January 24, 1978.

Cust. & Pat.App.

212 U.S.P.Q. 323

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Appendix 8: AMERICAN HERITAGE ELECTRONIC DICTIONARY (1992)

con·fig·ure (kən-fɪg'yər) *tr.v.* **con·fig·ured**, **con·fig·ur·ing**, **con·fig·ures**. To design, arrange, set up, or shape with a view to specific applications or uses: *an internal security vehicle that was configured for rough terrain*. [Middle English *configuren*, from Old French *configurer*, from Latin *cōfigūrāre* : *com-*, com- + *figūrāre*, to form (from *figūra*, shape; see **dheigh-** below).]